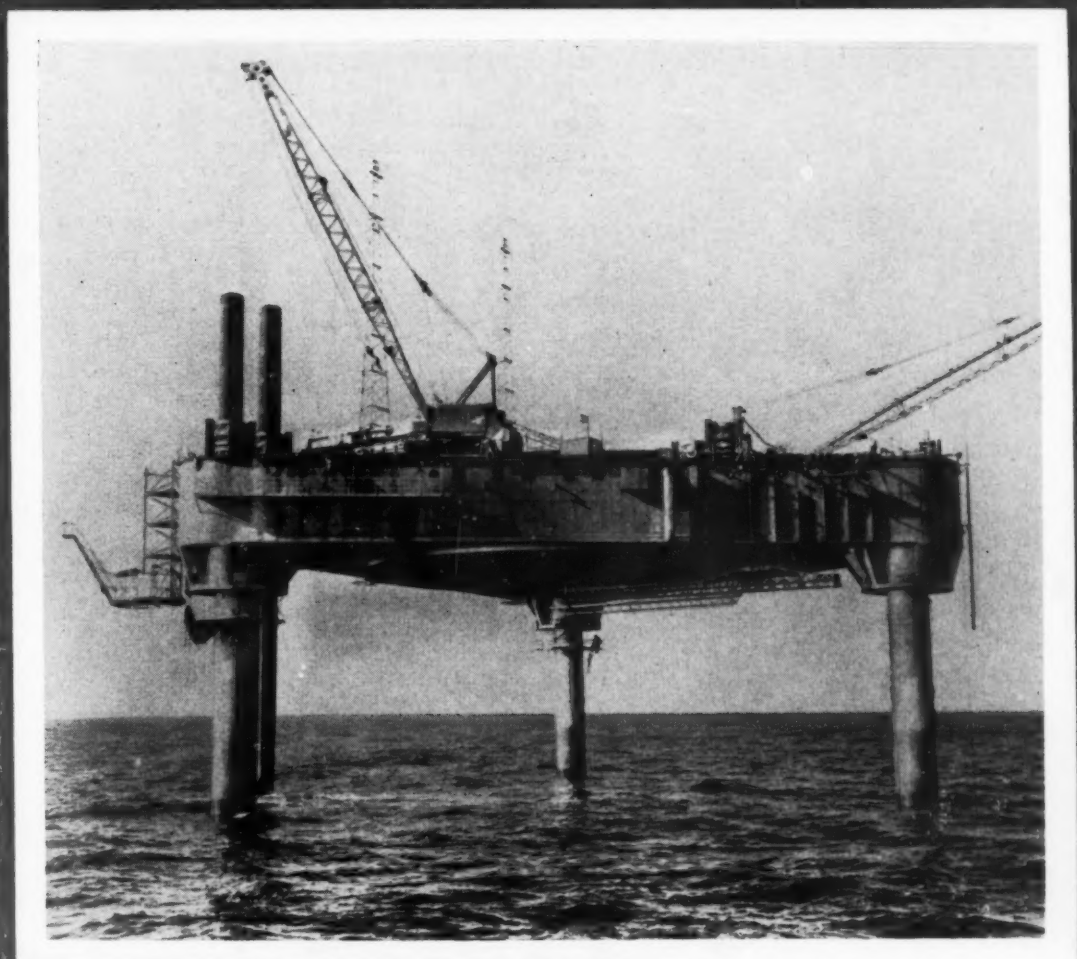
JANUARY 21, 1956
VOL. 150 — NO. 3

Telephony

THE JOURNAL OF THE TELEPHONE INDUSTRY



OCEAN WARNING POST

This radar warning station anchored off Atlantic seaboard is part of nation's air defense system. They search skies for approaching enemy aircraft. See editorial and article on page 17 for story on communications for SAGE.

Published every week on Saturday by TELEPHONY PUBLISHING CORP. 608 S. Dearborn St., Chicago 5, Ill. Subscription $3.50 per year. Entered as second class matter at the Post Office at Chicago, Ill., under the act of Mar. 3, 1879.

Guaranteed Circulation This Issue
10,805 of Which 10,278 is Paid

MANAGEMENT • PLANT • TRAFFIC • COMMERCIAL • LEGAL • ACCOUNTING

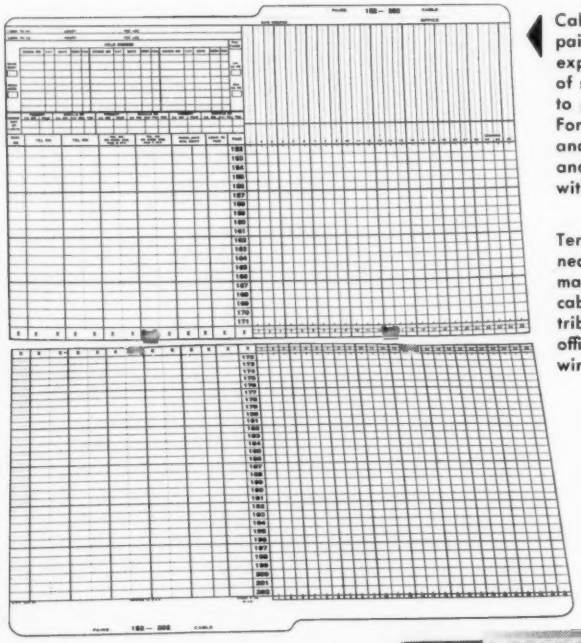
XUM

ACME VISIBLE

CABLE AND TERMINAL ASSIGNMENTS

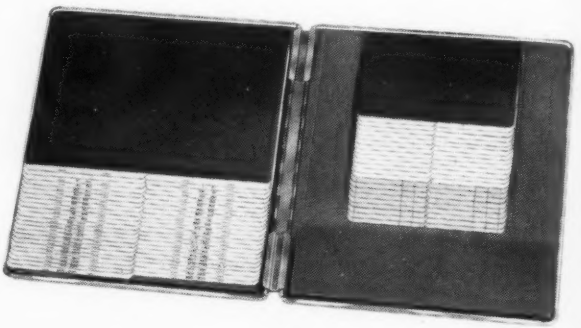
Designed by experienced telephone personnel to accommodate all of the various conditions encountered in the preparation of terminal assignment, exchange subscriber cable, and related basic plant records, in accordance with approved system practices.

Simplifies and speeds the work of assignment. Adaptable for large, intermediate and small centers with the flexibility to meet the requirements for peak and normal work loads, varying number of cables, and other local conditions.



Cable assignment forms. With preprinted pair numbers, filed in numerical sequence, exposing a 51 pair complement. Cards are of special Acme Endurex rag content stock to permit repeated erasures and changes. Forms available for 50 terminal capacity and 8 party stations; 44 terminal capacity and 10 party stations; and for rural areas with more party lines.

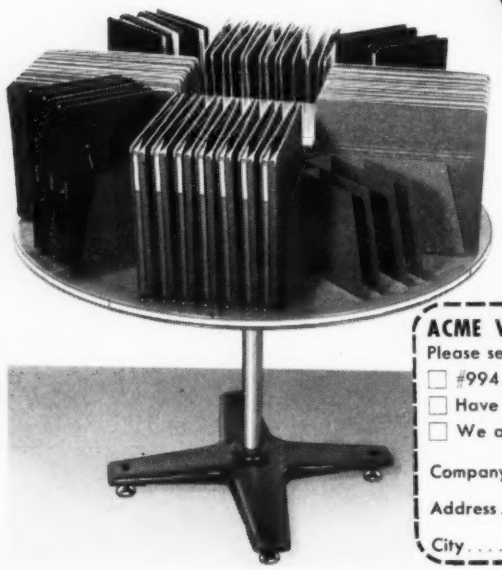
Terminal assignment forms. Eliminate the necessity of referring to supplementary maps to determine the correct distribution cable terminal. Forms available for distribution by (1) street, block or alley; (2) office building or apartment; (3) exchange wire.



Light weight metal-edged visible books for filing of cable cards on one side and terminal cards on the other, or for the same card on both sides of the book. Attractive gray Keratol binding.

Visible cabinets are available in a number of sizes. Each tray has a maximum of 102 forms or the equivalent of 5,100 cable pairs. Cabinets can be either stationary on stands or desks, or mounted on turntables.

Rotary equipment available in various sizes with and without push button motor. Books slide in and out without any lifting. They provide accessability to records at many points around circumference, and permit clerk to do a complete cable throw.



ACME VISIBLE RECORDS, INC.

CROZET, VIRGINIA

ACME VISIBLE RECORDS, INC., Telephone System Division, Crozet, Virginia

Please send us illustrated booklet

☐ #994 on Acme Multi-Card Bulletin Holders ☐ #982 on Acme Flexoline for Telephone Companies

☐ Have representative call. Date..... Time.....

☐ We are interested in Acme Visible equipment for ..... records.
KIND OF RECORD

Company..... Attention.....

Address.....

City..... Zone..... State.....

XUM

NUMBER 17
Toll grade. These insulators are employed for all exchange circuits and for all toll and trunk circuits that do not exceed ten miles.

Dependable ...in emergencies

When they're on the line, you can *depend* on their strength and uniform high quality.

When you order you can *depend* on prompt deliveries of what you need . . . when you need it.

Since 1870, when Robert Hemingray began mass production of screw-thread insulators, Hemingray has pioneered most of the insulator developments to keep pace with the requirements of the communication systems of the world.

Today, as always, Hemingrays are world standard for quality, and most of the overhead telegraph and telephone lines of the world are carried on *dependable* Hemingray Glass insulators. They are a product of Kimble Glass Company, subsidiary of Owens-Illinois, Toledo 1, Ohio.

HEMINGRAY INSULATORS
AN (I) PRODUCT

OWENS-ILLINOIS
GENERAL OFFICES · TOLEDO 1, OHIO

Now! New! Exclusive!

A SUPERIOR FM TELEPHONE CARRIER

Surprisingly Economical for Subscribe

Add new revenue on your existing facilities—increase subscriber satisfaction with this remarkable cost-saving FM carrier system. Field-tested for more than 5 years and proved to be the finest on the market, it is now being manufactured expressly for Kellogg by the Panhandle Electrical Construction Company. Because of its many advantages, it is being extensively used by the *largest telephone operating companies in America.*

For full technical details, contact your branch office or write Electronic Sales Department of:

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ER AVAILABLE IN 10 CHANNELS

be and Trunk Service

Here's what this carrier does for you:

- **Provides more channels** . . . 10 channels per circuit . . . 20 channels per pole lead . . . will not interfere with standard AM carriers on the same circuit.
- **Saves you money** . . . actually a low original investment which pays off in *low* maintenance costs.
- **Gives you satisfied customers.** High carrier gain and wide voice band make signals come through loud and clear.
- **Accommodates all types of signaling,** including 10-party full selective divided or bridged ringing, code ringing, superimposed ringing . . . E & M dial signaling, too!
- **Gives you trunk service, too** . . . ideally suited for additional economical toll or EAS trunks.
- **Offers you a complete line** . . . outdoor cabinets, subscriber drop and transfer filters.
- **Makes servicing easy** . . . parts are interchangeable . . . transmitters, receivers, power-supply, signal unit—everything all plug-in. Field maintenance is much simpler.
- **Fits in with your present equipment** . . . will not interfere with most multi-channel carrier systems . . . operates from 48 volt battery or commercial power line.
- **Makes installation easy** . . . averages less than a day for one man.

XUM

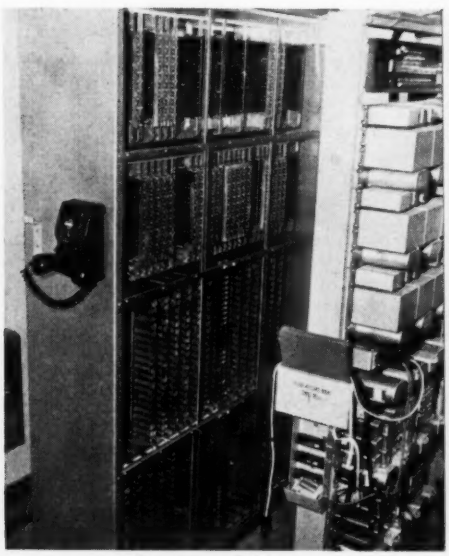
One fellow tells another...

that's why there are ove 600 LEICH DIAL SYSTEMS in

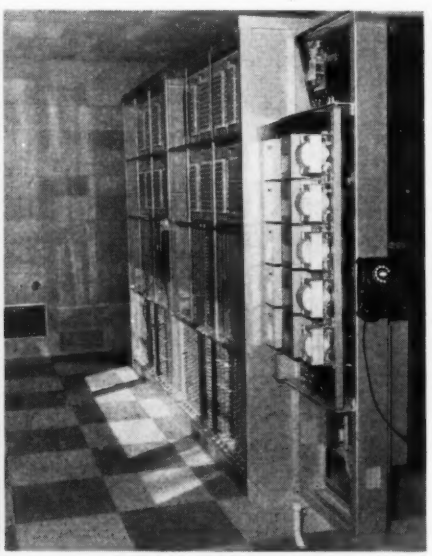
If you plan to purchase a dial switchboard, consider this. The Leich Dial System was introduced on September 28, 1947. Right now, there are over 600 Leich Dial Systems in service.

We, here at Leich, aren't that good as salesmen. It's just that those who had installed Leich Dial Systems had so much good fortune with them that they told their friends about it.

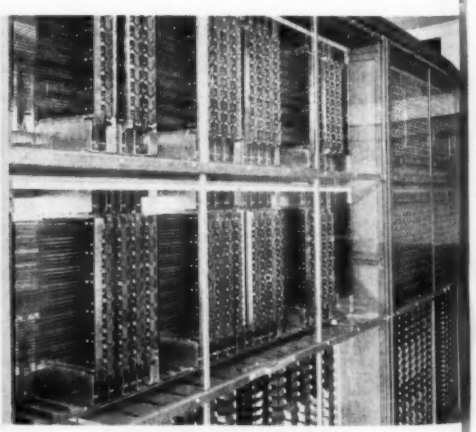
May we suggest that you visit some of the Leich Dial System installations near you. You'll find it interesting and you may get some profitable ideas for your company.



Bascom, Ohio



Shelton, Nebraska



Mt. Blanchard, Ohio

LEICH

ve600
Mn service -

MORE DEPENDABLE SERVICE

There are no mechanical moving parts in the Leich Dial System. All the operations are performed by full-size, heavy-duty relays. These relays have been tested for millions of operations without showing signs of wear, without requiring adjustment. Leich Dial System owners are giving fast, reliable telephone service with fewer service interruptions than they ever thought possible.

JACK-IN LINES AND LINKS

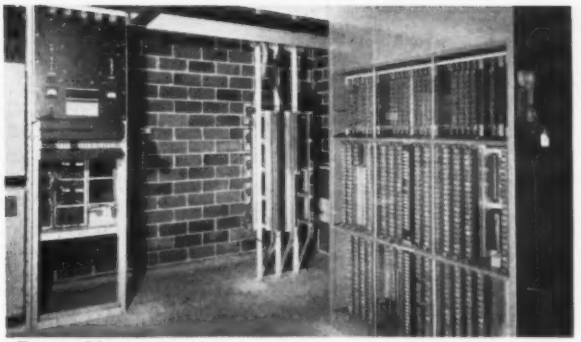
This is a flexible switchboard. Additional lines and links may be jacked-in, with no wiring or soldering, no factory installer needed. Ten lines can be added in ten minutes at a total cost of $175.00.

With this jack-in feature, it is quick and inexpensive to take equipment out of one board and put it in another when traffic conditions warrant it.

EVERY SERVICE FEATURE

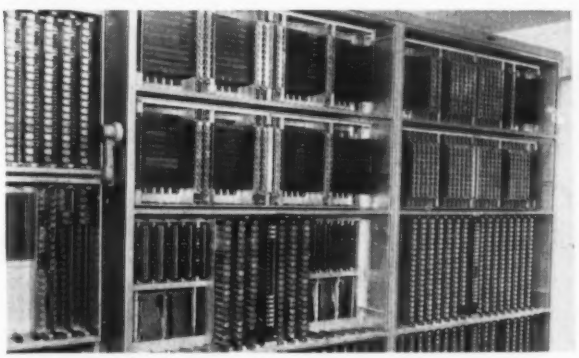
With a Leich Dial System you can offer your customers the latest in modern telephone service. All desirable service features are incorporated in this switchboard and special features can be furnished by the use of inexpensive adapter circuits. Extras available include digit absorbing equipment for 2-letter, 5-numeral numbering, a new, inexpensive intercept arrangement for main and party lines, and a simple, inexpensive fire reporting adapter.

We'll be delighted to tell you more about the Leich Dial System. Write today.

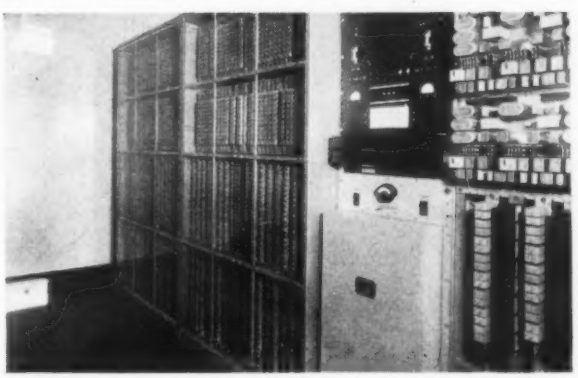


Rice, Minnesota

Sloan, Iowa



Fouke, Arkansas



Hamburg, New Jersey

MANUFACTURERS OF TELEPHONES, SWITCHBOARDS AND RELATED APPARATUS SINCE 1907
LEICH SALES CORPORATION 427 W. RANDOLPH STREET CHICAGO 6, ILLINOIS
PACIFIC COAST: 11401 WEST PICO BLVD., WEST LOS ANGELES 64, CALIF. SOUTHWEST: 1227 SLOCUM ST., DALLAS 7, TEXAS

GENERAL SYSTEM INDEPENDENT

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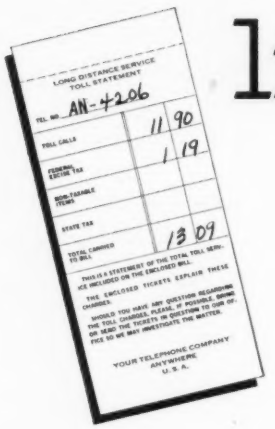
No matter how many toll calls she makes .. her bill will look like this


LONG DISTANCE SERVICE
TOLL STATEMENT
TEL. NO. AN-4206
TOLL CALLS 11 90
FEDERAL EXCISE TAX 1 19
NON-TAXABLE ITEMS
STATE TAX
TOTAL CHARGED TO BILL 13 09
THIS IS A STATEMENT OF THE TOTAL TOLL MESSAGES INCLUDED ON THE ENCLOSED BILL.
THE ENCLOSED TICKETS EXPLAIN THESE CHARGES.
SHOULD YOU HAVE ANY QUESTION REGARDING THE TOLL CHARGES, PLEASE, IF POSSIBLE, BRING OR SEND THE TICKETS IN QUESTION TO OUR OFFICE SO WE MAY INVESTIGATE THE MATTER.
YOUR TELEPHONE COMPANY
ANYWHERE
U. S. A.

Recordak's Toll Billing System reduces the number of entries per bill to 5 or less

No listing of each and every call is required because the toll tickets are microfilmed and sent out with the bill. This cuts billing time 45% or more . . . saves up to 99% in filing space. And all but ends subscriber questions.

Over two hundred telephone companies are now cutting costs . . . improving subscriber relations with this system.

All you need is a Recordak Junior Microfilmer, which you can rent for as little as $17.50 per month; or buy for as little as $550. No other equipment needed. The Recordak Junior has a built-in film reader, too.

"Recordak" is a trade-mark

She gets pictures simply by pressing a button on Recordak Junior Microfilmer

RECORDAK

(Subsidiary of Eastman Kodak Company)

originator of modern microfilming

—and its application to telephone routines

MAIL COUPON FOR FREE FOLDER

RECORDAK CORPORATION (*Subsidiary of Eastman Kodak Company*)
444 Madison Ave., New York 22, N. Y.

Please send folder describing Recordak Toll Billing System in detail. HH-1

Name _____ Position _____

Company _____

Street _____

City _____ State _____

TEN YEARS of Dependable Service PROVE

TELEPRENE® DROP WIRE

is the BEST OBTAINABLE . . .

TELEPRENE Drop Wire has been in constant use by independent telephone companies under all types of conditions for over ten years and is still giving dependable service. Test samples installed on our plant roof in 1944 have withstood the New England weather without showing any appreciable signs of deterioration.

3 reasons for TELEPRENE'S excellent service record:

. . . Exclusive Teleplate coating on conductors which assures enduring adhesion of insulation to conductor and protects against corrosion.

. . . Stable, high dielectric strength Buna insulation.

. . . Specially compounded, tough, weather resistant neoprene jacket.

Be sure to specify TELEPRENE on all new construction and replacements . . . it will save you money and assure your subscribers of trouble-free service for years to come.

TELECABLE® EXCHANGE AREA CABLE

TELECABLE® INSIDE WIRING CABLE

DISTRIBUTION WIRE

Whitney Blake Company manufactures a complete line of telephone wire, cord and cable to meet all your needs.

INDEPENDENT

Well Built Wires Since 1899

©1956

WHITNEY BLAKE COMPANY

NEW HAVEN 14, CONNECTICUT

XUM

FLASHES AND PLUGS

ONE WAY OUT. In Great Britain, reports state, young lovers and all varieties of chatterboxes tying up the nation's telephone lines will be cut short by a new post office plan.

New coin boxes will be fitted in the 100,000 public telephone kiosks, it is reported, and from then on callers will get only three pennies' worth of talk for three pence.

A post office official said: "There have been many complaints about people 'hogging.' Once we made a check and found that 80 per cent of local calls ended within six minutes. But the rest went on and on, especially those apparently made by young lovers."

A study group is considering what time limit to impose on local calls. It is likely to be six minutes.

•

PATIENCE IS THE WATCHWORD. John Q. Public can be amazingly misty-minded off and on . . . as who knows better than a telephone operator! For instance, Claude H. Downard, manager of the Potosi (Mo.) Telephone Co., wrote us recently about the day after his company cut over from common battery to dial service. Seems the lady called the office in a quandary . . . she couldn't call a local number because there wasn't a number eleven on the dial.

The AP reports a similar boo-boo from Texas, where a Houston operator gave a customer the number of a cab company: CApital 7-6329.

"And how," said the customer after a pause, "do you make a capital 7?"

•

RIGHT CHURCH, WRONG PEW. The television set was out of order, so a Baltimore family put in a call for the repair man.

Later, as the lady of the house was speaking over the telephone, the doorbell rang to admit a man carrying a small bag.

"Where's the patient?" the visitor asked.

"Over there," said the householder, pointing to the TV set.

The man with the little bag couldn't do anything about it, though. He was a doctor who had gone to the wrong house by mistake.

•

WHICH INDEED? The UP relayed the story about the sweet young thing who telephoned a newspaper to ask a football score and was told it was 7-0 at the half.

S.Y.T.: "Which half?"

•

FORCIBLY DETAINED. A Washington patrolman caught two men fishing coins from a sidewalk telephone, reports the UP.

He hailed a taxicab and had the driver pin the telephone booth door shut with his cab, holding the two men inside until the police wagon arrived.

CIRCULATION

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THE JOURNAL OF THE TELEPHONE INDUSTRY
Since 1901

January 21, 1956

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Telephone WA bash 2-2435

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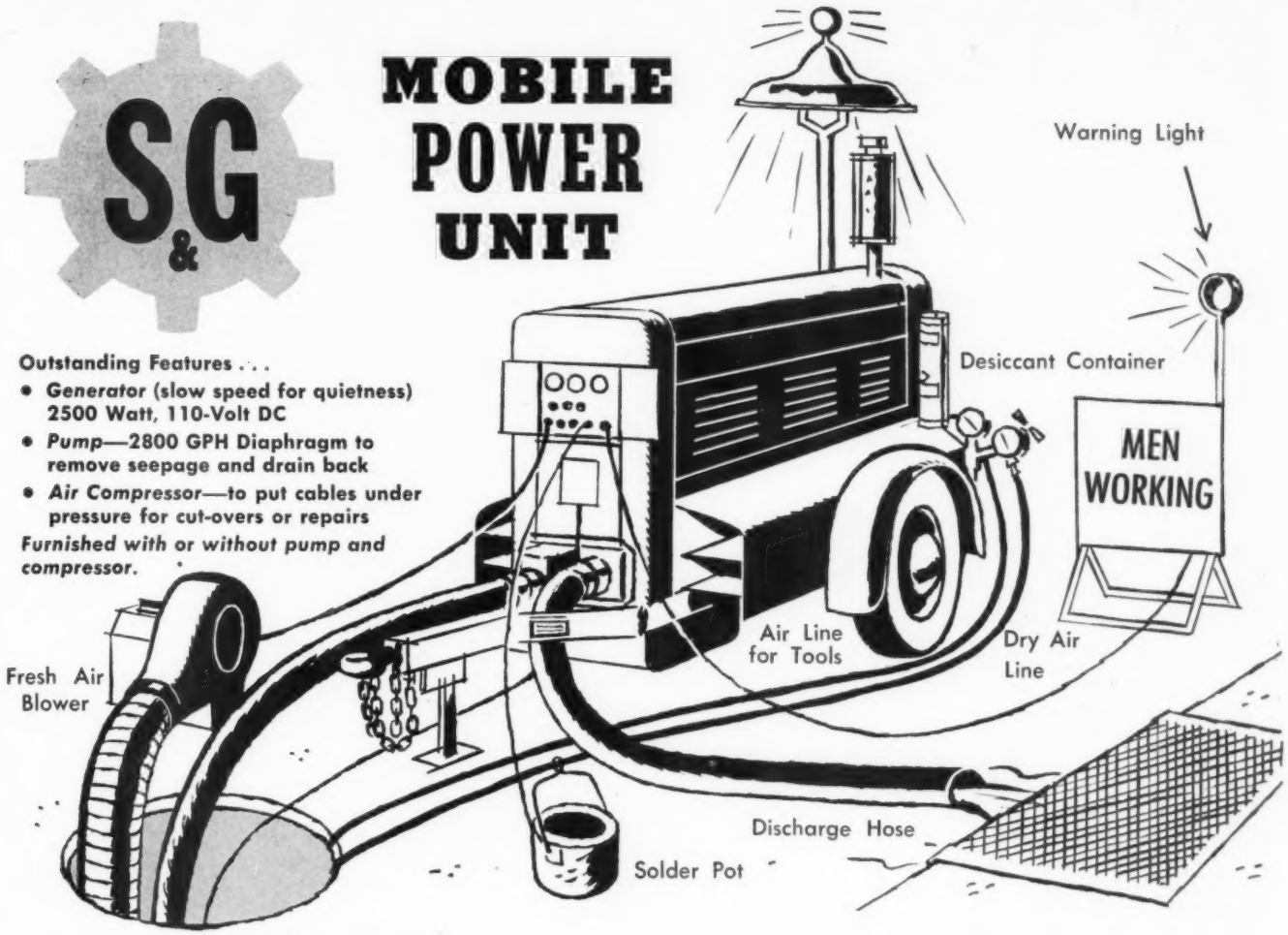
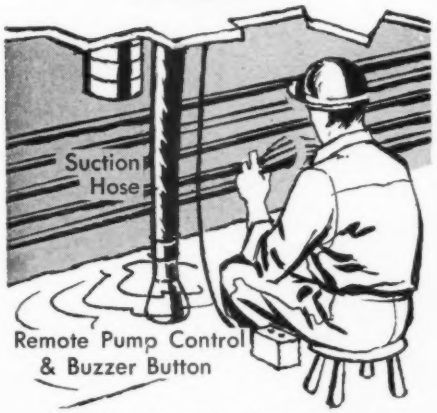
S&G MOBILE POWER UNIT



Outstanding Features . . .

- ***Generator*** **(slow speed for quietness) 2500 Watt, 110-Volt DC**
- ***Pump*****—2800 GPH Diaphragm to remove seepage and drain back**
- ***Air Compressor*****—to put cables under pressure for cut-overs or repairs**

Furnished with or without pump and compressor.



- 300-Watt floodlight illuminates working area
- operates soldering pot and iron, electric and air tools
- electric blower to ventilate manhole
- supplies dry air for cable cut-overs, flash testing, etc.
- diaphragm pump can be operated from manhole by push button control
- buzzer signal for summoning helper
- light, easy to handle

write or phone

S&G MANUFACTURING CORPORATION

P. O. Box 1309 • New Orleans 10, La.
RAymond 3142

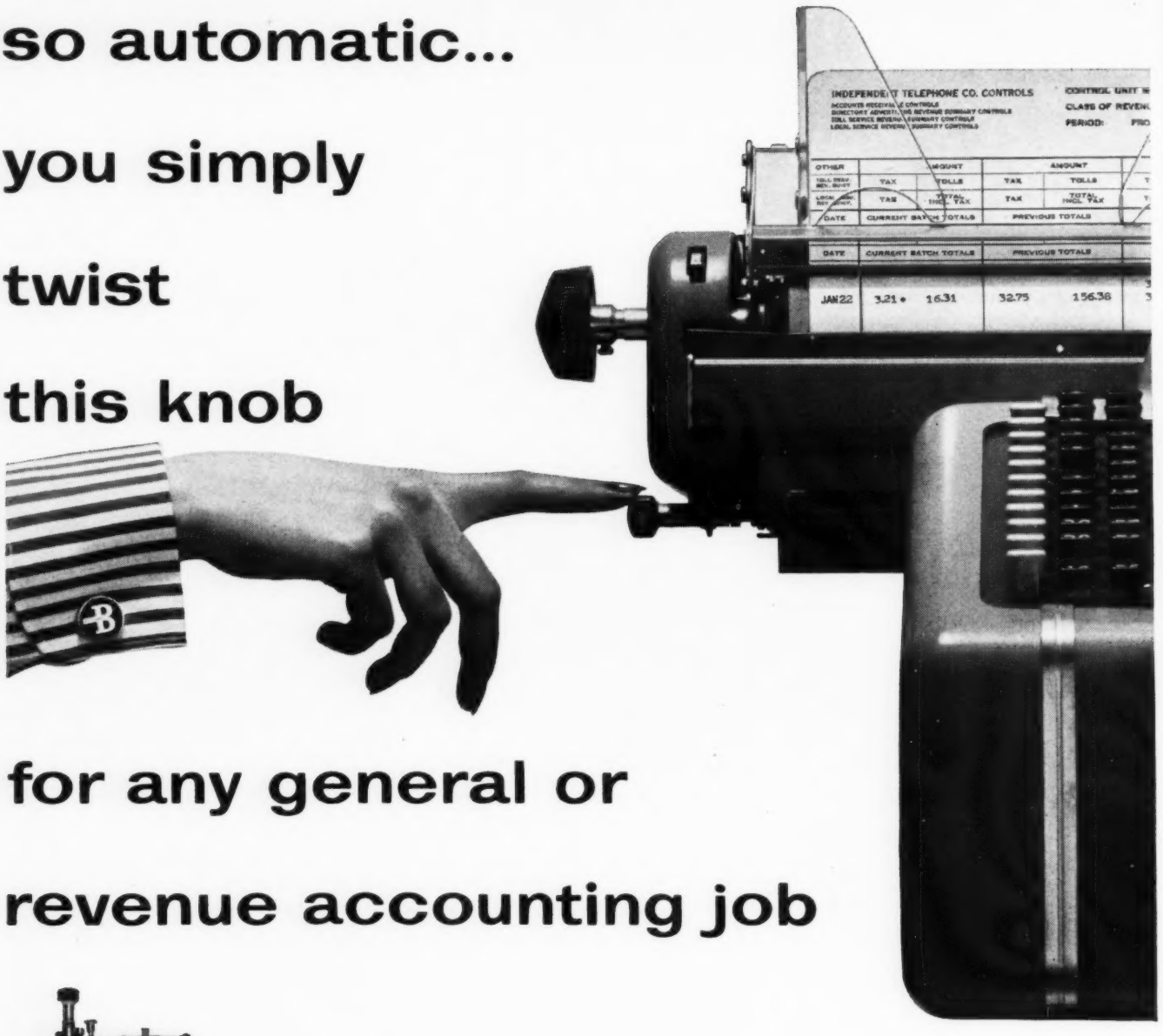
XUM

so automatic...

you simply

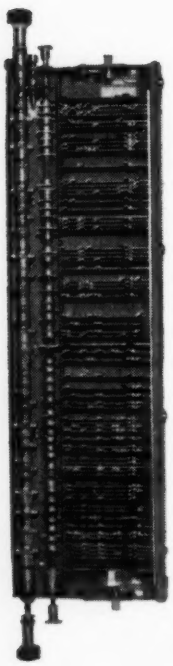
twist

this knob



for any general or

revenue accounting job



A simple twist? . . . Yes, that's all! And you instantly switch from one accounting job to another. How is this possible? Look to the left. There you see the "how" of a Burroughs Sensimatic Accounting Machine's amazing automation and versatility. It's the exclusive *sensing panel* or control unit that directs your Sensimatic through every general or revenue accounting job.

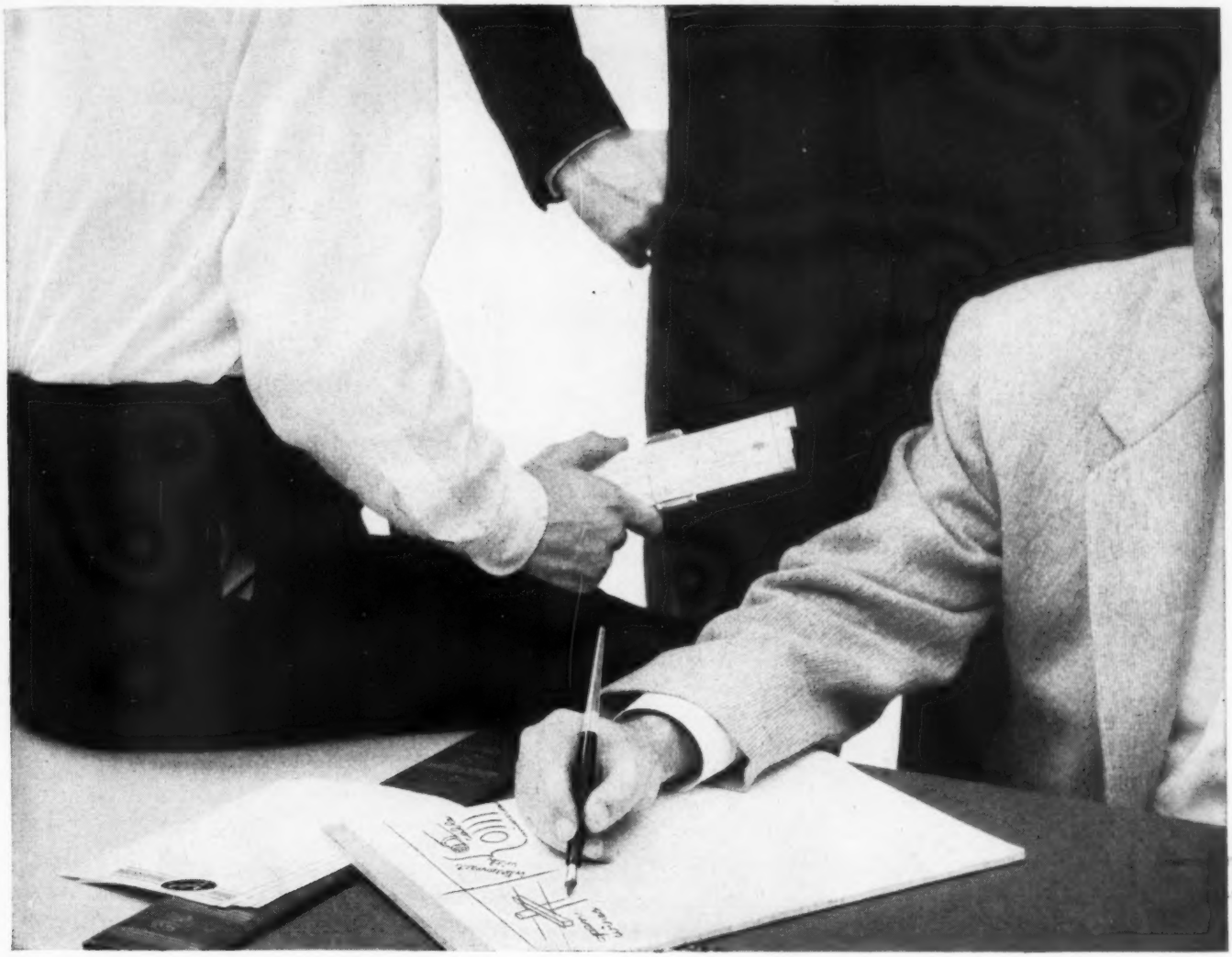
One panel speedily takes care of local service and toll billing, accounts receivable, revenue and tax summary records. Then, you merely slip out the *revenue* panel and slip in the *general* panel. You're now ready to prepare neat, accurate payrolls, pay checks, earnings statements and employees ledgers, general operating, materials and supplies ledgers.

What's more, a Sensimatic's speed and simplicity of operation (plus its capacity to do double duty) mean you cut accounting costs right to the bone—no matter what the size of the territory you serve. Initial cost? That's plenty low, too! Demonstration? Just call our nearest branch office. Or write to Burroughs Corporation, Detroit 32, Michigan.

Burroughs Sensimatic

Burroughs

"Burroughs" and "Sensimatic" are trademarks



how Lenkurt's new

INTEGRATED CARRIER CONCEPT can save you money!

There's a brand-new concept in carrier: integration. Now for the first time, carrier-derived telephone circuits can be planned to flow smoothly from open wire to cable to microwave—at carrier frequencies using the same type of carrier equipment!

Consider what this means in *simplicity*—in *better performance*—in *savings!* Expensive back-to-back equipment arrangements to convert carrier to voice to carrier are no longer needed. The result: less distortion, fewer maintenance problems, and a substantially increased range and scope of carrier applications.

Three interconnectible 45-type systems are now available: 45 A (12-channel, open wire); 45 BN (24-channel, cable); and 45 BX (24 to 120-channel, radio). Other systems are under development.

With Lenkurt's "Integrated Carrier" concept, carrier now enters a new, wider stage of usefulness. *Find out about this new concept today!* For detailed literature on 45A, 45BN, and 45 BX carrier, write: Automatic Electric Sales Corporation, (HAymarket 1-4300), 1033 West Van Buren Street, Chicago 7, Illinois. *In Canada:* Automatic Electric Sales (Canada) Ltd., Toronto. *Offices in principal cities.*

Manufactured for

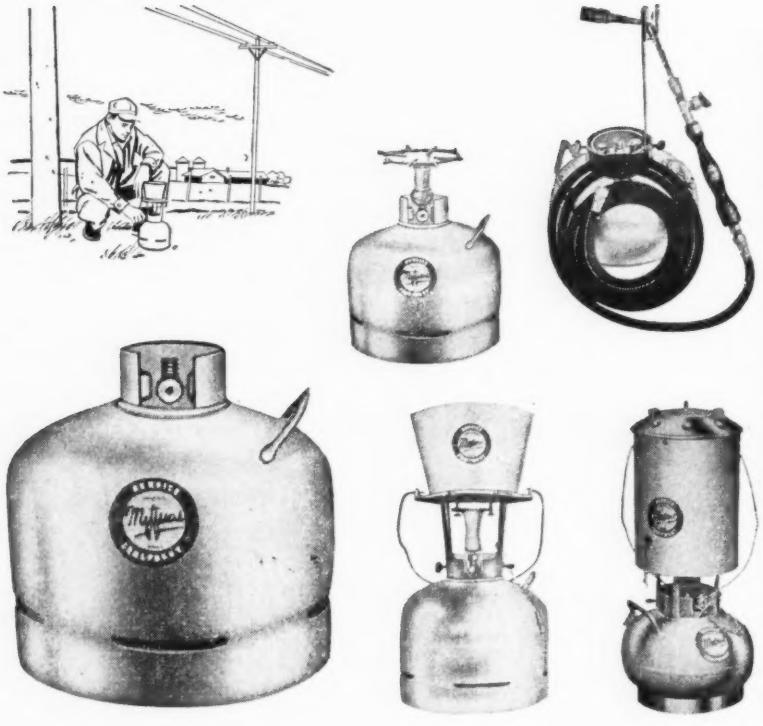
AUTOMATIC ELECTRIC

ORIGINATORS OF THE AUTOMATIC TELEPHONE

AUTOMATIC ELECTRIC • LEADERS IN CARRIER COMMUNICATIONS • **LENKURT**

XUM

Automatic's pointers for plantmen

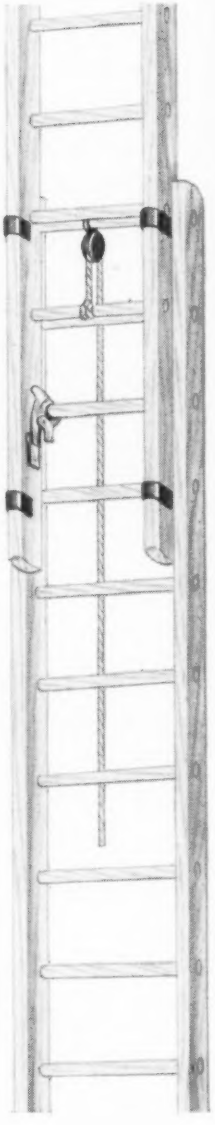


This Mutual gas tank performs like magic:

- Can be transformed in seconds into a furnace — heater — soldering assembly — field stove.
- Pumping time is changed to *working* time!

It's almost magical, too, the way this tank gets going. Time was when you had to pump, prime, and preheat a furnace before it would really get started. With the modern convenience of liquid propane gas, that nuisance is gone forever. The pressure is already in the tank. All you do is turn the valve and hold a lighted match over the orifice—and instantly you have a strong, steady flame! Order a complete set of Mutual liquid propane gas equipment—or start with just the pieces you need. See Automatic Electric's big new catalog for details.

Going Up? Be sure of your steps!

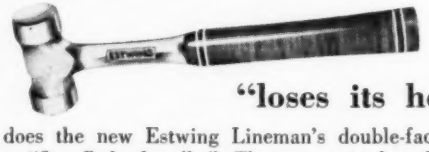


The strength of a Babcock ladder is apparent the moment you set foot on a rung. The ladder's firmness, solid feel and smooth finish are all proof of top quality and workmanship. And as your confidence increases with each sure-footed step, it is reflected in more productive, efficient work.

This "Utilities grade" extension ladder is made of selected white spruce in two 12-foot sections; top part complete with spring lock, pulley and rope. Weighs only 48 pounds. Other sizes also available!

Cat. No.	Each
S-5153	$27.45

The hammer that never "loses its head"



Nor does the new Estwing Lineman's double-face hammer ever "fly off the handle." The reason is that the head and shank are molded out of one solid piece of fine tempered tool steel. The head *can't* come off — and the handle won't crack; you save time and money replacing loose, broken, or splintered handles.

Like all Estwings, the Linesman's hammer is perfectly balanced with just the right hang for steadier work without tiring. Handle is covered with genuine sole leather washers for a comfortable, non-slip grip.

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The Story About SAGE Communications

THE TELEPHONE industry recently was an innocent victim of criticism originating in Washington on one phase of the Department of Defense's SAGE program (Semi-Automatic Ground Environment), which is the name given to the project to improve the nation's air defense system, by converting it from manual to semi-automatic operation, in order to defend more adequately and efficiently our nation from enemy air attack.

The SAGE project will utilize a great deal more of the existing communication facilities of Bell and Independent telephone companies than are now used in the present manual air defense system, as well as new facilities which will have to be constructed by those companies. The government, through the Air Force, will lease these additional SAGE facilities from Bell and Independent companies as is the case in the present air defense system.

Government sources have estimated that the cost of communication service provided by Bell and Independent operating companies required for the SAGE system may run as high as 240 million dollars annually. A few months ago, U. S. Comptroller General Joseph Campbell stated this expenditure should have congressional approval before the money was paid out. Mr. Campbell did not suggest there was anything wrong with the Air Force's plan of leasing these private telephone facilities, but because of the size of the amount to be spent he thought Congress should approve the expenditure.

But Mr. Campbell's words were somewhat twisted by some members of Congress, who, probably through misunderstanding and misinformation, or lack of information, inferred that Campbell had challenged the service arrangements with the telephone industry—in fact, inference was left that there was a conspiracy and corruption connected with the negotiations between the Air Force and our industry.

However, it is interesting to note that Congress had given the General Services Administration (GSA) authority to contract with utilities for the provision of services on a year-to-year basis, and the GSA delegated this power to the Departments of Army, Navy and Air Force, and it is understood that congressional committees had been kept informed of plans for SAGE. No questions apparently had been raised by members of Congress as to the necessity or feasibility of the SAGE project.

It may be that the Air Force should have obtained authorization for expenditures for the SAGE communication facilities just to be on the safe side, but apparently it thought it already had authority to go ahead. But, under the circumstances, the affair hardly adds up to a conspiracy or a scandal, as some of our political friends would have the public believe.

Inasmuch as the communications phase of SAGE has been brought into politics, and because there might have been created some false impressions of the telephone

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industry, we are publishing two articles which will give our readers, particularly telephone employes, the full story of the SAGE project and an explanation of the arrangements that have been made between the Air Force and the telephone industry to provide adequate communications for the project.

The first article appears on page 17 of this issue. It is an address given by Maj. Gen. Gordon A. Blake, Director of Communications, Headquarters, United States Air Force, before the Armed Forces Communications-Electronics Association. General Blake tells the important part communications will play in the over-all SAGE program.

The second article will appear in next week's issue and will explain the arrangements made between the Air Force and Bell and Independent telephone companies for the provision of communication services and facilities for SAGE.

We hope all telephone employes will read closely these two articles so they will become better acquainted with SAGE and be in a position to explain fully the communications phase to those who might have received an untrue and distorted picture as a result of the "political" discussion of the subject.

"There is no monopoly—and we seek no monopoly—in the harnessing of the atom for man's benefit. Rather we seek to encourage participation in that task. In particular, we want the maximum participation of American industry. Our standard of living is a product of its tools and techniques. The magnitude of the return which can be realized by the application of those same tools and techniques to the new field of atomic energy is immeasurable."—Dwight D. Eisenhower, *President of the United States.*

"*The Manchester Guardian*, sitting on the Liberal side line in an election fought between the two big mass parties, Conservative and Labor, offered a bit of sober advice to the defeated Laborites. The election result, the paper said, 'showed that this chatter about Labor needing a "Socialist" policy is nonsense. It does best with a moderate social reform policy and no nationalization adventures.' "—William Henry Chamberlain, *columnist, The Wall Street Journal.*

"The times and the American people are both calling for a surcease in collectivism and in socialized welfare. A statesman in 1955 ought to be putting his mind to restoring (not to debilitating) the initiative of the American people; to reforming instead of expanding the present-day relief laws which are scandalously abused."—Holmes Alexander, *columnist, Los Angeles Times.*

Scramble! And in less than two minutes after the alert is sounded over our air defense system these pilots of the 44th Fighter Bomber Squadron in the Pacific are airborne to check an unidentified aircraft. The fighters are F-86 Sabrejets.

Our Air Defense System

Semi-Automatic Ground Environment (SAGE) project of Department of Defense dependent upon facilities of private telephone companies.

By Maj. Gen. Gordon A. Blake*

SINCE WORLD WAR II, this nation has built up a new kind of peacetime economy. It is an economy which devotes over one-half of the federal budget to military defense. Never before in the nation's long and prosperous history has so much money been devoted to defense in time of peace.

The American taxpayer has borne the high cost of this policy without complaint. The public, however, has an interest in what this cost is buying in terms of our military strength. The Department of Defense would like to report more information to the public more often. But we are frequently restrained by security considerations. The very defense we are all working together to create, can be damaged by unwise or untimely releases of information.

One of the prime benefits, however, in publicizing and explaining defense problems is that it helps to secure cooperation from people in all walks of life. And one of the important things we need in our air defense system is cooperation from the average individual citizen. After all, one of the prime purposes of the air defense system is to save the civilian population. Hence, it is particularly important that the average person take an interest in this system, and devote effort aggressively to learning his part in it.

I can tell you a little bit . . . of just what the Department of Defense is doing to give you the best air defense system in the world. We know that this can be accomplished by making the system as automatic as possible.

(Please turn to page 20)

*General Blake is Director of Communications, Headquarters, United States Air Force. He gave this address before a recent meeting of the Armed Forces Communications Electronics Association, held in New Haven, Conn.

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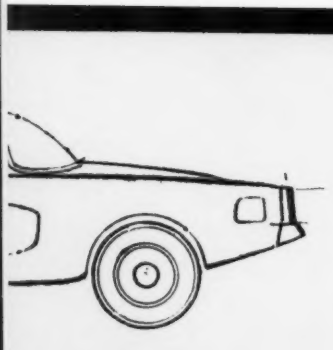

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(At left) The superbly styled No. 120 Switchboard. Capacity: 80 extensions, and either 15 plug-ended trunks and 15 cord circuits or 10 jack-ended trunks and 10 cord circuits.

(At right) The pert No. 121 Cordless. Just 14″ high and 26″ wide. Capacity: 5 trunks, 16 extensions, 5 connecting circuits, and common talking circuit for extensions. A similar model for smaller installations provides 3 trunks, 12 extensions, 5 connecting circuits, and common talking.

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Because it has become evident that some type of reliable, automatic operation is necessary to achieve the speed and efficiency the job calls for.

A good deal of this automatic operation is wrapped up in a project called SAGE. While this term is not completely strange to many—since it has appeared in various press releases—I suspect that some of you may share the misconceptions about SAGE which have resulted from fragmentary comments on the subject. This talk will be, in effect, a report to you on SAGE.

First, what does the word SAGE mean? It is actually a short title derived from the words *Semi-Automatic Ground Environment.* The Semi-Automatic part is more or less self-explanatory since it relates to the techniques employed to handle information. However, the Ground Environment part is a bit ambiguous—this is a term coined by the Air Force to describe the complex of electronic equipments installed at ground locations and used to provide some sort of operational service. In the case of SAGE the operational service being performed is the handling of large volumes of information or data in solving air defense problems. In short, SAGE is a project for improving our air defense by applying semi-automatic operation to our handling of information and the direction of weapons. It is not a new air defense system but rather a major improvement in the one we already have built and are operating today.

The need for semi-automatic operation becomes evident when you consider the great volume of flight information pouring into the system. This over-all volume possibly is as great in peacetime as in wartime. All aircraft flights must be watched and identified by the defense system. There are 30,000 scheduled flights per day, plus a great many more unscheduled. Information about these flights is fed to our defense system from 13 sources. Many of these sources are completely operational. Others are rapidly being developed and expanded. They are:

The first is the heavy surveillance radars within the United States.

The second is the heavy, height-finder radars. Height-finders are necessary because most surveillance radar do not give altitude.

Third, there are small gap-filler radars, between the large radar, to cover the gap which large radar cannot see.

Fourth, for civil aircraft, flight plans and other information are relayed from the CAA flight service centers.

Fifth, for military aircraft, similar information is relayed from the Military Flight Service.

Sixth, there is the Pine Tree line. This is the name given that part of the United States radar fence which laps over into Canada.

MAJ. GEN. G. A. BLAKE

Seventh, there are our early warning lines. One is the Mid-Canada line, which extends across Canada from British Columbia to Newfoundland. The other is the DEW Line (Distant Early Warning) which extends across the top of Alaska and Canada. Plans for the arctic line were the subject of a joint Canadian-American announcement in September 1954. Overcoming the rigors of the arctic to establish the DEW Line has been one of the most dramatic accomplishments of the radar extension program.

Eighth, there are radars in southern Alaska.

Ninth, there are Navy picket ships along the Atlantic and Pacific Coasts. These floating radar islands extend the land-based radar coverage for hundreds of miles out to sea.

Number 10, supplementing the coverage at sea are the Constellation AEW&C aircraft (Airborne Early Warning and Control). These giant aircraft are actually flying radar stations, each carrying five tons of electronic equipment and a crew of 18 men. They greatly expand the "seeing" coverage of the air defense system. AEW&C planes not only patrol a great area, but they can lift radar several miles in the air to scan a much greater line of sight distance.

The 11th source of information for SAGE is the radar on man-made islands anchored to ocean shoals off the Atlantic Seaboard. These are called Texas Towers because they resemble oil derricks in the Gulf of Mexico.

The 12th source of information is the Ground Observer Corps, the GOC. This is made up of thousands of average citizens who volunteer and donate their time to watch the skies a few hours a week. Radar can see through darkness and storm, but human eyes can still pick up essential information that radar cannot. We want to expand the GOC to one million sky watchers at 24,000 locations.

The 13th source of information is also important. It is the Air Weather Service. In order to successfully assign and guide weapons, we must know the weather. For example, in order to direct an interceptor to a specific point in the sky at a specific moment to make an interception, the computer must know how the wind will affect the speed of both bomber and interceptor.

The sum total of all data from these 13 sources, pouring into our defense system today, is staggering. And it will be even more when all expansions, now in progress, are completed.

All of this information must be correlated and used by the Continental Air Defense Command—which we call CONAD. CONAD Headquarters, located in Colorado Springs, directs our entire continental air defense. It is a joint command. This means that applicable portions of the Army, Navy, Air Force and Marines have been combined together under one military commander. This gives CONAD direct maximum access to defensive weapons in a maximum number of places. And it provides essential unification of authority, segregation of responsibilities and consequently, quicker, undelayed striking power.

CONAD has the authority, when an air threat occurs, to order weapons into action. There are Air Force interceptors on alert 24 hours a day, seven days a week. Or CONAD can order interceptions by Navy planes, to the extent of their availability, from carriers or shore stations. Army anti-aircraft guns or missiles can be used.

Simultaneous with ordering weapons, CONAD will alert the Federal Civil Defense authorities, the Federal Communications Commission, and the Civil Aeronautics Administration. Liaison representatives of each of these agencies are members of the battle staffs at each defense sector headquarters. To insure that civilian planning is complete, up-to-the-minute and feasible, these agencies maintain continuous close contact with activities at CONAD.

Limitations in Information Handling

To be able to properly exercise such far-reaching authority, CONAD must first process and evaluate all of the air situation data. Whether the system is manual or automatic, flight plans must be compared to radar readings. All air tracks must be numbered. Information as to bearing, distance, height, and speed must be continuously fed to subsector headquarters as the aircraft is tracked. (For air defense the country is divided into subsectors.) After identification as friendly, the information is voice-telephoned to the next subsector. Only when a plane cannot be identified is the information sent

(Please turn to page 37)

IN THE NATION'S CAPITAL

BY FRANCIS X. WELCH, WASHINGTON EDITOR

Outlines subjects covered at two-day conference of REA Telephone Consultants Committee. . . . Conferees release recommendations. Action seen on communications excise taxes and on federal executive pay raise.

BUSINESS SEEMS to be picking up on the REA telephone loan program, according to information released at a press conference held on Jan. 10 in the office of REA Administrator Ancher Nelsen. The purpose of this conference was to inform the press of developments in connection with the two-day meeting of the REA Telephone Consultants Committee.

This committee is composed of representatives of the telephone industry (Independent and Bell telephone companies), telephone cooperative borrowers, and REA specialists. The committee considered a number of matters of mutual interest, including engineering, accounting, management, and procedural problems of REA rural telephone borrowers.

The committee considered lending support to the forthcoming battle in Congress to obtain compensation for utilities in connection with relocation expenses due to federal-aid highway construction. It also considered the availability to REA telephone borrowers, and others, of telephone circuit business by the Defense Department growing out of the SAGE (Semi-Automatic Ground Environment) project being set up by the Bell System in cooperation with other telephone carriers for the Air Force. The committee is conducting a survey of telephone industry opinion of REA. In general, however, the meeting reflected optimism that the rural telephone program will register notable gains in the forthcoming year of 1956.

The intent of Congress is the keynote of the REA rural loan program, according to REA Administrator Ancher Nelsen. At a press conference, covering the work of the committee of telephone consultants, Nelsen said that the congressional intent was to bring more telephones to more farms and to insure a higher quality of service—not simply to make loans as such.

In carrying out this intent, Nelsen said, REA has sought to enlist the cooperation of the telephone industry as a whole—as well as cooperatives. It was pointed out that during the period of the REA program—virtually since 1950—the number of farm telephones has increased 13.2 per cent, although the number of farms had declined a little more than 11 per cent during this same period.

The installation of modern, high-quality farm telephone service has now nearly equaled the numerical high point of old-fashioned farm telephone service in the early twenties, which was followed by a general decline in the number of farm telephones. REA officials are hopeful that during the coming year a numerical high point of farm telephone installations will be reached and that, in the words of Administrator Nelsen, "more telephones will be ringing on the farms of America next year than ever before."

One of the reasons for Nelsen's optimism about the progress of the REA rural telephone loan program is that applications for rural telephone loans received during the current fiscal year up to New Year's Day were about double the amount received in the same period last year. The over-all number of applications for loans during the past year was roughly about the same.

But REA expects that loans during the balance of the current fiscal year (which expires July 1) will total 80 million dollars setting a new high for the REA program. At the beginning of the fiscal year, Congress had made available in new lending authority 75 million dollars. There was also available a carry-over from the previous year of 33.6 million dollars; and about one million dollars in loans previously authorized were rescinded during the year.

Assuming, therefore, that REA is able to make the expected total of 80 million dollars in loans approved, it will end up the fiscal year on July 1 with a carry-over of slightly less than 30 million dollars. What Congress will do in the way of new lending authority for the fiscal year 1957 will be revealed in the budget, soon to be sent down to Congress from the White House.

In view of the fact that this is an election year, Congress can be expected to appropriate at least as much for the politically popular REA during the forthcoming year as it did during the current year in new lending authority —75 million dollars. If these calculations are correct, REA should go into the next fiscal year with about 100 million dollars in new lending authority for rural telephones. But all this is subject to congressional adjustment of budget figures and the actual performance of REA on loans between now and next July.

One aspect of the REA telephone loan program operations, which is worthy of at least passing interest, is the character of the loans being made this year as compared with previous years. In short, it would appear that the proportion of REA loans made for *new construction* is declining, while the proportion going to *financing and acquisitions* is increasing. Here is a breakdown of REA loans along this line for the fiscal year 1954 to 1956 (as of Nov. 30):

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	For Fiscal 1954 Per cent	For Fiscal 1955 Per cent	For Fiscal 1956 to Nov. 30 Per cent
New construction	50.8	46.5	43.2
Improvements	41.5	43.9	43.8
Refinancing	1.5	3.0	4.2
Acquisitions	4.1	4.6	6.3
Operations	1.9	1.8	1.7
Other	0.2	0.2	0.8
Total funds required	100.0	100.0	100.0
Less cash equity required	4.3	4.4	4.1
Total loans	95.7	95.6	95.9

The number of cooperative borrowers has been increasing, following a trend which began several years ago. But the number of commercial telephone companies borrowing from REA has increased much more rapidly in recent months. Only six months ago the number of co-op and commercial companies borrowing from REA was just about even. Today there are roughly about seven commercial telephone company borrowers for every six cooperative borrowers. The statistical breakdown on this is:

	Number of borrowers as of June 30, 1954	June 30, 1955	Dec. 31, 1955
Cooperative	151	175	189
Commercial company	128	176	226
Total	279	351	415

REA has apparently made some progress in scaling down the number of delinquent borrowers. But the total *dollar* amount of overdue payments, delinquent over 30 days, has increased. It went over the half-million mark for the first time last November. Here is the statistical breakdown of the financial status of REA borrowers:

	June 30, 1954	Nov. 30, 1955
Total payments due	$1,610,000	$3,434,037
Total payments made	1,208,000	2,935,381
Principal	981,000	1,912,175
Interest	227,000	1,023,206
Advance payments	7,000	112,300
Payments delinquent over 30 days	376,000	527,398
Number of borrowers delinquent	38	24

Consultant Committee Statement

A brief statement on the two-day meeting of the REA Telephone Consultants Committee was released on Jan. 11 and contained the following points of recommendation:

Optional rather than required use of competitive bidding for central office equipment by REA borrowers;

Provision for co-op borrowers to use instalment payments in collecting subscriber equity;

Continuation of the present three-year deferment period on repayment of principal and interest on telephone loans; and

More symposiums and training schools for REA telephone borrowers and consulting engineers.

The consultants expressed appreciation for the comprehensive report on the SAGE project (air attack warning system) by Col. William C. Henry, who explained in a general way the participation expected by the telephone companies. Colonel Henry went over the development of the telephone industry agreement with the Air Force,

(Please turn to page 44)

REA Makes Telephone Loans in Oregon and Texas

Loans to provide new dial service for more than 2,000 farms and other rural establishments in Oregon and Texas were made by the Rural Electrification Administration during the first week of 1956, the U. S. Department of Agriculture announced on Jan. 10. The loans totaled $314,000. Details follow:

Estacada (Ore.) Telephone & Telegraph Co. on Jan. 5 was authorized to borrow $434,000, its first REA loan, to improve and extend rural telephone service in Clackamas County.

The new borrower, a commercial company, now provides magneto and common battery service to 993 subscribers, including 260 switchers owning their own lines. With these loan funds, it proposes to convert the existing system to automatic operation and add facilities to serve 317 rural families now without telephones.

Present plans include the acquisition of 40 miles of Forest Service line, and the construction of a new central office and headquarters building at Estacada.

Of the existing 134 miles of line, 72 miles are in good condition and will be used in the expanded system; 37 miles will be rebuilt and 25 miles retired. In addition, 109 miles of new line will be added.

The borrower is considering the use of some rural subscriber carrier in order to make practicable service in remote areas of its operating territory.

The completed system will consist of 218 miles of line over which the borrower will furnish dial service to 1,310 subscribers. This includes the 260 switchers who plan to sell their lines and become regular subscribers of the Estacada company.

Floyd W. Day is president of the Estacada company.

*

Home Telephone & Electric Co., Baird, Tex., also on Jan. 5 was allocated $380,000, its first REA loan.

The new borrower, a commercial corporation, proposes to use the loan funds to improve and extend rural telephone service in and around Baird, Putnam and Moran in Callahan and Schackelford Counties. At present the Home company is furnishing common battery and magneto service to 742 subscribers over 217 miles of line.

The borrower plans to construct a new automatic central office at Putnam, and convert the Baird central office to automatic operation. The new automatic facilities, already installed in the Moran exchange but not yet in service, will be expanded to serve surrounding rural areas.

Forty-nine miles of new line will be added to the system. Of the existing line, 122 miles will be rebuilt, 84 retained in place, and the remainder retired.

These changes will enable the Home company to bring modern telephone service to 91 new rural subscribers and 15 additional ones in the town of Baird.

The loan funds will also be used for refinancing existing indebtedness of the borrower.

Mrs. T. P. Bearden is president and Mr. Fabian Bearden is manager of the Home company.

THE Operator's Corner

By MAYME WORKMAN — TRAFFIC EDITOR

THE *Florida Telephone News*, published bi-monthly for the employes of the Florida Telephone Corp. to inform them about the telephone business and to acquaint them with the activities of members of their telephone family, contained a most interesting item in its December issue on New Year's Resolutions and, since 1956 is in its infancy, they are reproduced below for your consideration:

NEW YEAR'S RESOLUTIONS
FOR EVERYBODY

Managers and Supervisors

(1) I will not criticize a subordinate or manager or supervisor in my own or any other department in the presence of another subordinate.

(2) I will not act "bossy" or grouchy. I will keep a smile rather than a frown on my face when contacting those under me.

(3) I will have due respect and regard for the feelings of my workers so they will have due respect for me and my authority.

(4) I will not reprimand or discipline a subordinate in the presence of others or in an offensive way. I will make the workers feel I want to help them.

(5) If any of my subordinates are sick or incapacitated, I will visit them and show a personal interest in their welfare, on and off the job.

(6) I will keep my personal conduct, on and off the job, so that no worker will have "anything on me."

(7) I will make sure that I do not become "puffed up" with my authority and dictatorial in my relations with those under me.

(8) In giving orders I will avoid a "Do this" and "Do that" manner of speaking and substitute for it, "Please do this" or "I wish you would do thus and so."

(9) I will read regularly TELEPHONY and Telephone Engineer so I can keep up to date with practices and developments in my department.

(10) As the head of my department I will faithfully observe organization routine and not give orders to employes working directly under a supervisor, foreman, plant manager or chief operator, for I know it is confusing to an employe to have more than one boss.

(11) I will keep continually in my mind the fact that the guiding principle in the company's employe relations policy is to make employment in the company satisfactory to the employe.

(12) Regularly I will examine my conduct with those under me to see how well I am earning the high praise of being a "good boss," for that is the finest compliment that can be paid to one in my position.

Employes in All Departments

(1) I will be sure that every personal contact, with fellow worker or customer, ends on a friendly note.

(2) I will be pleasant and courteous on every occasion, no matter what the provocation.

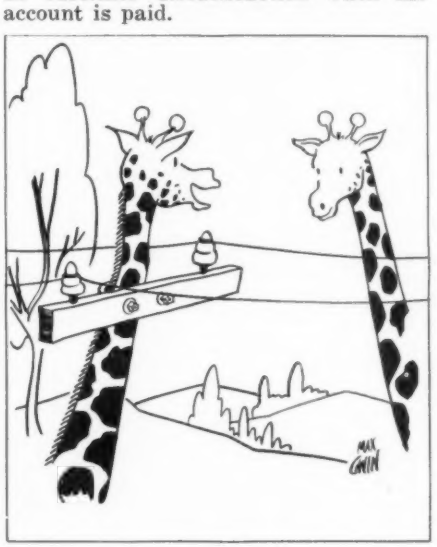
(3) I will answer each switchboard call promptly and courteously.

(4) I will repair each out-of-order telephone as efficiently, economically and as quickly as possible. I will do my plant work right even though it takes longer.

(5) I will be nice about collection of accounts, but insistent as well. I will keep the customer friendly, but I will get the money.

(6) I will be sure that line orders are sent in correctly and as soon as possible after completion.

(7) I will be sure that toll tickets are made out correctly so there will be no customer dissatisfaction when his account is paid.



"I got a job with the telephone company."

(8) I will be careful to avoid accidents on and off the job.

(9) I will not be a buck-passer and pass the blame for service failure to some other employe or department.

(10) I will be certain we can provide service wanted by the customer before I tell him he can have it.

(11) I will pass on to my supervisor any suggestion for the improvement of the service and the company's public and employe relations, so that management can do something about it.

(12) *I will keep smiling.*

"Turning over a new leaf" is a good habit at the beginning of the year as well as any other time for there is always room for improvement in all of us.

MY NEW YEAR'S WISH

May the best things of
the old year
Join with good things
in the new
And fill all the days
that lie ahead
With happiness for you.

Traffic Questions

(1) Which calls should be carried forward at midnight?

(2) At midnight, if the date to which a ticket is to be carried forward has not already been entered on the back, should this information be entered?

(3) If the calling party is not holding the line on a long distance call, when should you ring the calling telephone?

(4) Whenever the information or auxiliary operator asks a question in order to obtain additional details, to verify spelling, or to suggest possible listings, should the outward operator allow her to deal directly with the calling party in so far as possible?

(5) If the outward operator is dealing with an information operator, and cannot furnish the requested details immediately, should she ask the customer, for example, "Will you speak with the (place) information operator, please?"

Answers are presented on page 52.

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ASK FOR CARRIER BULLETIN C-554-2

Available in Canada through ERICSSON TELEPHONE SALES of CANADA, Ltd. 1410 Stanley Street Montreal 2, P.Q.

NORTH

te service..."

COUNT the lines on which you are now selling "multi-party" service. Multiply by four.

There you have the number of customers for whom you can provide private lines by making use of North Telephone Carrier. You can do it at a surprisingly low cost compared to the improvement in service —and in revenue. You can do it in most instances without adding a pole or a crossarm.

Perhaps you have thought of carrier in terms of adding customers by tens and twenties. You can do that, too, because each North channel will serve as many stations as any metallic pair. Four channels can be "stacked" on a line without disturbing the physical circuit.

But, on today's high standard of living more customers want a higher standard of telephone service. More of them can afford to pay for it. The low cost of carrier-borne circuits makes it a sound investment for you to fill this increasing demand. The best way is to . . .

increase capacity for private
or two-party service
on existing lines with

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NORTH ELECTRIC COMPANY

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THE Plant Man's Notebook

BY RAY BLAIN, TECHNICAL EDITOR

THE FOLLOWING remarks were made in a letter from G. P. Seyffect, district plant manager, of the Bell Telephone Co. of Pennsylvania, at New Castle, Pa., with reference to the article titled, "Grounded or Insulated Guys," printed in the Dec. 3 issue of TELEPHONY.

"An item not discussed is the possibility of picking up direct current potentials and feeding them up over the grounded guys, along the cable to the underground, and discharging current to earth with resulting 'electrolysis' troubles.

"Some difficulties of this nature have been encountered in western Pennsylvania. Of course, we have coal mines, and we have some rather large variations in ground potential which do not seem to be the result of man-generated direct current. In other words, they are brought about from earth conditions."

If any of our other readers have experienced this difficulty when grounded guys are used, we would be pleased to receive a report as to how this trouble has been overcome.

•

While attending the Wire & Cable Symposium up at Asbury Park, N. J., recently, we had an interesting talk on cable terminals for use on plastic cable with Bill Strehl, sales manager of the telephone division of Cook Electric Co.

The Cook Electric Co. now manufactures the new Splice Maker designed for cold splicing of lead or plastic-sheath distribution cable from 11 to 101 pair (¼-inch to 1-inch diameter) sizes. This new unit provides flexibility with five combinations of two components to make the through splice, Y-branch splice, X-splice, terminal splice and the Y-branch terminal splice.

•

In El Paso, Tex., recently we noticed the name and telephone number of a contractor stamped in a concrete sidewalk. We have never been one to brag unduly about Texas, and this may not be another Texas first. We do, however, admire the ingenuity of this man just as we condemn the many business firms which do not include the telephone number on their letterheads.

•

A public ceremony was held recently in Syracuse, N. Y., to mark the passing of the last of the city's old telegraph fire boxes as they were replaced by a new telephone-type fire reporting system.

It is further reported that last Hallowe'en, there were only two false or unnecessary alarms turned in over the new telephone system. On previous Hallowe'ens, with the old telegraph system, the fire department was kept busy as pranksters turned in scores of alarms from the old boxes during their night's meanderings.

It would appear to be good business for many Independent operating companies to promote the installation of fire reporting systems in their communities. Not only will this action increase revenue, but it will also promote public relations by furnishing a much-needed public service.

Miami, Fla.; Indianapolis, Ind., and Omaha, Neb., now have this modern fire-reporting service. We understand also that a system is being installed in Muncie, Ind.

•

We have an interesting report from a commercial testing laboratory on tests made of six automobile safety belts. The first belt tested was all cotton, 2 inches wide, 3.1 millimeters thick and equipped with adjustable slide friction buckle. The strap pulled out of the buckle on a test load of 300 pounds.

The second belt was all cotton 2 inches wide and 2.75 millimeters thick. It was equipped with a cam-type buckle with five ridges and a smooth opposing surface. The strap broke at the "L" bar under a 2200-pound load.

The third belt was all nylon, 1¾ inches wide and 2.7 millimeters thick. It was equipped with a cam-type buckle with five ridges on the cam and serrated opposing surfaces. The strap pulled out of the buckle on a 2500-pound load.

The fourth belt was nylon-covered rayon 2 inches wide and 2.7 millimeters thick. The cam-type buckle had five ridges on the cam and a serrated opposing surface. The strap pulled out of the buckle under a 3,000-pound load.

The fifth belt was all nylon, 1⅝ inches wide and 2.5 millimeters thick with a metal-to-metal buckle. The bolt head was stripped and the floor fixture bent out of shape on a 3500-pound load.

The sixth belt tested was all nylon, 2 inches wide and 2.5 millimeters thick with a metal-to-metal buckle. This belt did not fail on a 5500-pound load.

On this test, the belts were all installed strictly in accordance with the manufacturer's instructions using the hardware and fixtures supplied with each separate belt. A hoist with a speed of 40 inches per minute was used with the pull being applied vertically and therefore at a 45-degree angle from the car floor section. All loadings were read from a dynamometer.

This test would seem to indicate that anyone purchasing automobile safety belts from anyone other than the car manufacturer should exercise extreme care.

•

In Roanoke, Va., the "dial-for-a-prayer" plan of Greene Memorial Methodist Church has been discontinued because it was too successful.

The church announced on Nov. 27 that persons dialing the numbers which correspond to the letters "a s-o-u-l"—would hear a recorded prayer.

Thousands called the number, dis-

rupting telephone service for patrons whose numbers were somewhat similar.

Church officials were told that only specially designed, expensive equipment would handle the overwhelming load; so the church reluctantly discontinued the plan.

•

Recently we inspected a sectional, tubular, fiber glass pole that proved most interesting. This pole, when telescoped, was 50 inches in length and when fully extended, measured 40 feet.

Its total weight was only five pounds. The base section was about 2½ inches in diameter and the top about 1½ inches. The joints fit tightly on the taper and require a sharp twist or a rather severe jolt to release.

This particular type of pole was designed for a large power company, to be used in the removal of kites from high tension lines. It has also been used to some extent by both telephone and power companies to measure wire sag and clearances and pole height without climbing.

In addition, it would appear ideal for use as a wire pike pole, tree trimmer handles, etc.

We are confident that this item will have numerous other important uses in the communications field in the future.

•

Back in 1920, the Bell System started conversion to automatic operation. Today, about 85 per cent of the Bell System's telephones are dial-operated. Operators are now dialing nearly 60 per cent of all long distance calls. Customers now dial direct about one-fourth of all calls outside local areas. Yet employes of the Bell System now number about three times as many as in 1920 and over twice as many as in 1940 when about 60 per cent of the telephones were dial-operated.

The Bell System, including Bell Telephone Laboratories and the Western Electric Co., now employs more than 725,000 men and women—an all-time high. Moreover, increased customer usage has not only created more jobs, but better jobs that pay high wages. Telephone jobs nowadays compare favorably with those in other industries. In fact, the real wages of telephone employes are at new high levels. All this, despite frequent claims that automation will prove a detriment to the present-day workers.

•

It has been said that no man is a complete failure until he begins to blame his predecessor.

Plant Man's QUIZ

BY RAY BLAIN, TECHNICAL EDITOR

Q. Will you please indicate some uses of the closed circuit television that may prove of interest to operating telephone companies at some time in the future?

A. The following uses of closed circuit television have proved highly desirable and economical for the past several years:

(1) Cameras in weatherproof housing watch smoke emission from smokestacks. Operators at a control station may see immediately when fuel is being wasted.

(2) Hotels with TV receivers in guest rooms use the closed circuit type to promote their dinner menu, entertainment and other services.

(3) Instrument monitoring is another common application. (Instruments are sometimes spotted in dangerous locations or others too remote for centralized reading and control by conventional methods.)

(4) Assembly costs are reduced by cameras that watch conveyors and enable the dispatcher to avoid production delays.

(5) Announcing flights in airport dining rooms and lounges increases business and improves public relations.

(6) Cameras in weatherproof housings at remote plant gates enable one guard to watch several entrances at the same time.

(7) Use of cameras greatly increases the number of persons who can really see an experiment, a demonstration or an operation in a hospital.

(8) Remote control of traffic is practical and economical when TV closed circuit cameras see and report the varying conditions.

The above are only a few of the many possible uses of the closed circuit TV system. Many other uses and applications will undoubtedly prove desirable and economical in the future.

•

Q. Will you please explain why advantages are claimed for deep grounding over other commonly used methods?

A. In locations where conventional methods prove satisfactory, deep grounding is not necessary. In many locations, it is not possible to obtain a low resistance ground by conventional methods and deep grounding proves desirable.

This method provides a simple means of reaching the strata of better conducting soils which are often located a considerable depth below the surface.

For this reason, deep grounding may prove especially desirable in locations where it proves difficult to obtain low resistance grounds by means of 8 or 10-foot single rods and it is generally more economical than the use of multiple rods or soil treatment.

•

Q. Is it considered desirable to use removable jack sleeves for the multiple on a large common battery switchboard?

A. Jacks of this type are available and are being used to some extent. However, it is doubtful that their use will prove an advantage.

When a few of the jack sleeves become worn to such an extent as to cause trouble on a twenty-line jack strip, the remainder are generally worn enough so that it proves advisable to replace the entire strip.

•

Q. Would you please tell us when it will prove desirable to use small gauge cable in lieu of fuses to protect cable connected to a central office?

A. When an exposed cable of 22 gauge or larger enters a central office, a length of 24-gauge cable should be installed to provide current-limiting protection to the central office.

This small gauge section is usually installed at the junction of the underground or buried cable from the central office and the aerial cable. The conductor resistance of this short section of small gauge cable limits the current that can flow over the conductors in the event of a power cross.

If the current exceeds the current capacity of the conductors, they will fuse open. Actually, however, the fusing of the conductors seldom occurs even when a direct power cross is encountered.

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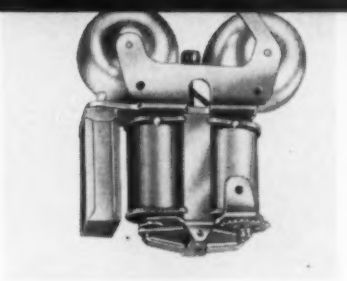
Type 80 ringers sound off loud and clear, even at the highest ringing frequencies. Here's your guide for fewer lost calls, less lost revenue—and an end to many, many ringing complaints.



Ringing condenser is mounted on ringer to avoid mistakes when changing telephones from one ringing frequency to another. Helps make maintenance swift, simple, and more accurate.

"*Boy* you can hear it 'way down here!"

'Way down in the basement, surprised subscribers find they can still hear their new Type 80 Monophones ring. It's a pleasant ring, yet it carries from living room to boiler room—even through the shouting of innumerable little Davy Crocketts. It cuts "DA" reports on toll calls, helps avoid loss of toll revenue.

Type 80's ringers are a new, improved design. Their gongs are especially pitched to give a sound that conquers distance and noise. Their coils are highly sensitive, even to low ringing voltages on long, heavily-loaded rural lines. Straight-line ringers come with volume control (if you wish) that the subscriber can adjust as easily as his radio or TV. Lines served by Type 80's are quieter, because the high impedance ringers do not cause unbalance and induction of noise.

No wonder telephone men say it's goodbye to ringing complaints when you standardize on Type 80's. And they're praising Type 80's remarkably clear transmission, low maintenance, "jiffy" installation, and smart styling as well. Send in your order for Type 80's today. Address: *Automatic Electric Sales Corporation, 1033 W. Van Buren St., Chicago 7. Or call HAymarket 1-4300.*

Type 80 Monophone—the Telephone you designed

AUTOMATIC ELECTRIC

ORIGINATORS OF THE DIAL TELEPHONE

GENERAL SYSTEM INDEPENDENT

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Courts and Commissions

Nebraska Company Given Authority for Rate Increase

Authority to increase rates effective Jan. 1 was given the Herman Telephone Co. on Dec. 30 by the Nebraska Railway Commission. Net increases are as follows:

	Number	*Old*	*New*
One-party business	33	$4.00	$5.00
Two-party business	0	3.75	3.75
One-party residence	40	2.25	2.75
Two-party residence	0	2.00	2.50
Four-party residence	62	1.75	2.25
Rural residence	227	2.50	3.00
Rural business	6	3.00	3.50

Increases are expected to produce additional gross revenue of $4,460. Total estimated annual revenue under the new rates is $22,216 and expenses $18,891, exclusive of $1,692 in taxes. This results in net earnings available for interest and dividends of $1,632, which is equivalent to a rate of return of 4.72% on a net book rate base of $31,114, plus an allowance for cash working capital, materials and supplies.

The company expects its maintenance expense to increase $600 annually and anticipates an increase in wages of $850. Increases in taxes are estimated at $450 and other commercial expenses $125. As a result of increased revenue, federal income taxes are expected to increase $35.67.

A large toll user installed a private two-way radio system and as a result the company looks for a drop of about $300 in toll revenue per year.

The Herman company serves 368 customers and provides common battery service over all metallic lines.

Orders Neb. Company Sales Approved by Commission

The Nebraska Railway Commission has issued a general order providing that no telephone company shall be sold, assigned, or otherwise transferred until approval of the proposed sale or transfer has been obtained from the commission. The order also applies to a sale or transfer of stock in a telephone company which will result in change of control.

Commission approval of the proposed transaction may be obtained by both parties filing a joint application with the commission. Upon notice and hearing and findings that the transaction is in the public interest, and that it will be of advantage to persons to whom service is rendered, and that the purchaser is "fit, willing and able" to perform the proposed service, an order will be issued.

Nebraska Company Asks to Increase Rates, Issue Bonds

The Indianola Telephone Co. has petitioned the Nebraska Railway Commission for authority to increase rates, issue bonds and eliminate toll-free service between Bartley and Indianola.

The commission also was requested by the Bartley Mutual Telephone Co. to eliminate toll-free service between the two exchanges.

The Indianola company plans to raise $77,000 in additional capital to finance a facilities improvement program including conversion to dial service (TELEPHONY, Jan. 14, p. 36).

State Supreme Court Rejects Rehearing of Ind. Bell Case

The Indiana supreme court on Jan. 10 rejected the Indiana Public Service Commission's petition for a rehearing of the Indiana Bell Telephone Co. rate case (TELEPHONY, Dec. 24, 1955, p. 28).

Last Dec. 1, the state's highest court upheld a Marion County Circuit Court order enabling the company to keep a circuit court-granted rate raise over commission objections.

The Jan. 10 supreme court stand was interpreted as freeing the challenged funds from escrow with any subscriber refund now ruled out.

The annual increase in income to Indiana Bell has been reported to approximate 7 million dollars.

Seeks N. Y. Bond, Stock OK

The New York Public Service Commission on Jan. 9 was to have heard the petition of the Cato & Meridian Telephone Co., Cato, for approval of amendment of its certificate of incorporation and for authority to issue and sell $125,000 of 4½ per cent first mortgage bonds; 750 shares of 5 per cent, $100 par preferred stock, and 854 shares of no par common stock.

Pennsylvania Company Asks Raised Rate Schedule

Pennsylvania Community Telephone Co., Dallas, filed a request for a new rate schedule with the Pennsylvania Public Utility Commission Dec. 29, it was reported. The company asked that the rates be made effective on Mar. 1. The requested rates are:

One-party residence, $5.75, one-party business, $8.00; two-party residence, $5.00, two-party business, $7.00; four-party residence, $3.75, four-party business, $5.50; multi-party residence, $3.75, and multi-party business, $5.50.

Acquired in August 1954 by the Commonwealth Telephone Co., Dallas, Pennsylvania Community Telephone Co. is operated as a wholly owned subsidiary. Pennsylvania Community operates 17 exchanges serving some 16,377 stations.

The new rates are needed to continue service and plant improvements begun in September 1954, it was stated.

Oregon Company Purchases Bell Plant Near Medford

The Oregon Public Utilities Commission recently authorized The Pacific Telephone & Telegraph Co. to sell to Columbia Utilities Co., Medford, certain exchange territory and outside plant facilities, not including station equipment.

Approximately 40 suburban party-line stations heretofore served by the Medford exchange of Pacific T&T were transferred to the White City, Ore., exchange of the Columbia company, effective Jan. 7. Extensive housing projects getting under way in the area are expected to increase the total stations by approximately 200. The area is contiguous to the White City exchange of the Columbia company, and subscribers now have available upgraded service through that exchange.

Extended area service between White City and Medford, and White City and Central Point and Eagle Point, Ore., was established some months previous.

For the first time in its history the Michigan Bell Telephone Co. has been using a mobile automatic telephone exchange to help meet pressing demands for telephones on a temporary basis while permanent facilities were being constructed. Automatic switching equipment was installed in a 40-foot box trailer (left photo), to be readily moved from one location to another throughout the state as facilities shortages develop. Up to 400 two-party subscribers have been served from the exchange (right photo) providing telephones for about 380 Garden City customers pending completion of new permanent facilities early in March. The portable exchanges may also be used for Civil Defense purposes or during emergencies of fires, tornadoes, or other disasters when a community's regular telephone service is disrupted.

Minn. Commission Authorizes Sale of Two Independents

The Minnesota Railroad & Warehouse Commission on Jan. 9 authorized the Rothsay Telephone Co., Inc., to purchase the Rothsay Telephone Co. from Omer L. Stowman.

The commission on the same date authorized the Halstad Telephone Co. to purchase Bygland Telephone Co., which serves approximately 76 stations in Polk County.

Report on December 1955 Orders of Ohio Commission

During December 1955, the Ohio Public Utilities Commission issued a number of decisions and orders, among which were the following:

Authority was granted The Lima Telephone & Telegraph Co. to reclassify its presently outstanding preferred stock and to issue and sell 10,000 shares of its first preferred stock, series B. The aggregate total of the series B issue is one million dollars.

*

An application by the Clarksfield Telephone Co. to increase its rates and charges by an amount that would give the company a rate of return of 2.1 per cent on a reproduction cost new less depreciation rate base of $42,-558.99 was granted.

The commission found that the old rates resulted in a deficiency to the company in annual income available for fixed charges in the amount of $1,425.14. The annual income available for fixed charges under the new rates will amount to approximately $891.20. The new rates were effective Jan. 1. The old and new rates are as follows:

	Old Rates (gross)		*New Rates* (gross)	
A. Within the base rate area:	Bus.	Res.	Bus.	Res.
Individual line:				
Wall type		$2.50	$4.00	$3.50
Desk or hand-set type	$3.25	2.75	4.25	3.75
Five-party:				
Wall type	2.25	2.00	3.25	3.00
Desk or hand-set type	2.50	2.25	3.50	3.25
B. Outside the base rate area:				
Ten party:				
Wall type	2.25	2.00	3.25	3.00
Desk or hand-set type	2.50	2.25	3.50	3.25

Individual line service will be furnished at the rates specified in "A" above for those grades of service, plus a net monthly mileage charge of 60 cents for each ¼ mile or fraction thereof, route measurement, between the base rate area boundary and the subscriber's location.

Each of the gross monthly rates shown under "A" and "B" above is subject to a prompt payment discount of 25 cents, provided payment of all charges for service, including rental for the current quarter, is made quarterly on or before the 25th day of the first month of the calendar quarter in which the service is rendered.

The company has approximately 200 subscribers.

*

The commission authorized the Ohio Telephone Service Co., Sidney, to establish rates for automatic service on an optional basis to the company's subscribers of the New Paris exchange. The following net rates will obtain for this service:

Business:	
One-party	$6.75
Two-party	5.50
Residence:	
One-party	4.15
Four-party	3.25
Rural:	
Multi-party business	4.50
Multi-party residence	3.15

The present magneto service net rates are as follows:

Base rate area:	
Business:	
One-party	$5.25
Two-party	4.50
Residence:	
One-party	3.50
Four-party	2.75

(Please turn to page 33)

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construction and maintenance DIGEST

- **Real cool sitting**
- **Guard 10 lines**
- **Button, button**
- **Grounding to pipe**

Published every week to help you get the most out of your materials and supplies dollar

by C. J. Reynolds, Stromberg-Carlson Company

The few dollars you spend on *reliable* equipment today will be repaid a hundredfold in lower maintenance costs for years to come. Protect your investment with the double guarantee offered by Stromberg-Carlson. First, leading manufacturers build this equipment, and guarantee it. Second, because we recommend and sell this equipment to the telephone industry, we *also* guarantee its performance!

Cane-seat chair keeps operators cool, comfortable

Making the operator as comfortable as possible may not strike you as a "maintenance" problem – yet your service is much smoother when the girls are cool and relaxed.

This operator's chair has a cane seat, which is much cooler, cleaner and more comfortable than other types. It retains all the posture advantages for which Sturgis is famed. It is called the Sturgis SC-240.

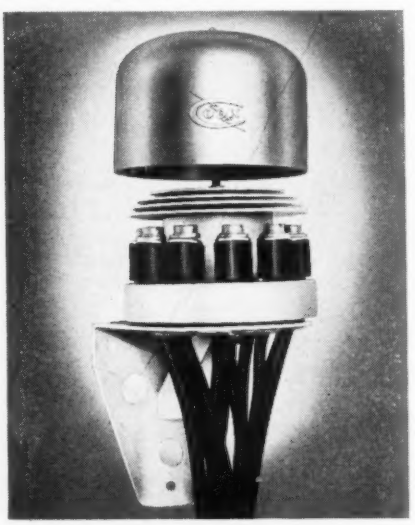
The posture-curved, well-cushioned backrest is covered in genuine leather.

The exclusive Sturgis "Follow-Flex" feature automatically adjusts to the operator's every movement, supports her restfully all the time, discourages fatigue, keeps her at top efficiency.

Other new and welcome features include a plastic-coated steel foot ring which retains its color, and a handy purse holder, available on request. Six seat heights, all adjustable.

The new 5 circuit Hy-Cap Power Cross Protector

Whenever telephones are in joint occupancy with power lines, a heavy-duty protector should protect the telephone lines against destructive power cross.



Now—Protect 5 circuits against power crosses with one protector.

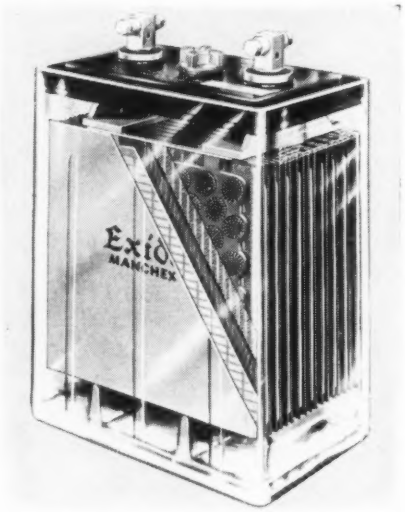
Such protection can now be had when the Cook Electric Company's Hy-Cap 5 Pair Power Cross Protector is installed. This unit mounts on a type 10B cross-arm and will protect 10 lines. Connections are made with pre-cut No. 10 plastic insulated copper wires which terminate on rugged discharge carbons. There is just one ground wire for easier installation. The protector will break down at 3000 volts and will continue to ground the fault current as long as it exists.

A single pair Hy-Cap Power Cross Protector is also available.

See your Stromberg-Carlson representative for further information.

Lead buttons mean lower costs

Only Exide Manchex Batteries have the positive plate with the buttons of corrugated lead tightly locked in the lead alloy grid several times more rigid than pure lead. Because of this outstanding design, the plates resist the mechanical strains bound to develop and retain their shape without growing or buckling. There is an ample reserve supply of pure lead which can be converted into active material as needed.



Special construction gives long life to Exide Manchex Batteries.

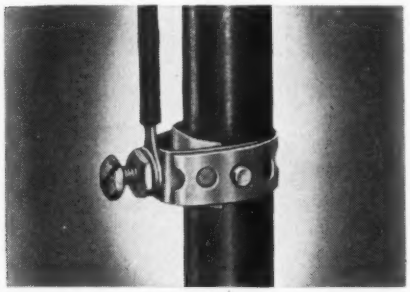
These and many other features combine to insure exceptionally long, trouble-free service.

To be sure of top quality, specify Exide Manchex Batteries when you order through your Stromberg-Carlson representative.

Want a good station ground for ⅜" to 1¼" pipe?

For all telephone, radio and signal circuit station grounds, here is a clamp with a tighter grip than a blonde clinging to a sailor's arm.

It's made by Reliable Electric Company, and has design principles which have been proven in the field to maintain high-pressure contact and maximum conductivity to the joint. This vise-like grip gives you the dependable grounding you need.



Station ground clamp is adjustable for grounding to water pipe, gives maximum conductivity to joint plus high-pressure contact.

The Reliable station ground clamp is for ⅜" to 1¼" pipe, easily adjusting for any size in that range. It is made of tinned copper strip. The screws and nuts have close-fitting threads.

For a solid station ground, ask your Stromberg-Carlson representative about Reliable station ground clamps.

Did you know . . . that the Stromberg-Carlson general catalog includes 105 pages of maintenance and construction supplies alone? You can do *all* your business "under one roof" and find the same quality and reliability in every item.

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Multi-party business	3.75
Multi-party residence	2.50

*

The commission also granted approval to The Eastern Telephone Service Co., Cortland, and the Cherry Valley Telephone Co. to the acquisition by the former of the physical assets of the latter on December 20.

*

Permission was granted on Dec. 22 to the Nova Telephone Co. to purchase the assets of Sullivan Telephone Co.

Following which by further order, the commission granted the application of the Nova company wherein the consent and authority of the Commission was requested to enter into a contract with the REA to execute a first mortgage upon all of the assets owned by the Nova Telephone Co. as well as the assets acquired by it from the Sullivan company and to issue its note or notes not to exceed the aggregate total of $146,000.

Ohio Commission Rules on Depreciation Accounting

The Ohio Public Utilities Commission on Dec. 29 acted upon the application of The Cleveland Electric Illuminating Co. wherein a request was made to the commission for authorization of appropriate accounting procedure with respect to accelerated depreciation as provided for under Section 167 (b) Internal Revenue Code of 1954.

In the commission's discussion of the case it was stated that a proper accounting entry is one which meets the test of sound accounting and which permits equitable treatment in a future rate proceeding of the benefits resulting from accelerated depreciation.

Of the three methods, namely, Restricted Surplus (Capitalization), Depreciation Reserve and Tax Reserve, the commission found that the Tax Reserve method best meets these requirements. The commission was of the opinion that both the Restricted Surplus and the Depreciation Reserve methods more strongly infer a predilection with respect to rate regulation than does the Tax Reserve method, and therefore, the latter method provides more flexibility in a future rate proceeding for equitable treatment of the benefits resulting from accelerated depreciation.

The contention of Cleveland Electric Illuminating Co. in this particular case —that a lower cost of capital would result from the Restricted Surplus method than from other methods and this would thereby benefit both company and customers—did not seem a compelling argument, the commission observed.

The argument, it said, is based on the premise that if the capitalization is increased by the amount of the tax benefits resulting from accelerated depreciation that a larger amount of low-cost bond money may thereby be obtained. However, the larger requirements to meet the increased equity portion of the capitalization might well offset any such benefits on the debt portion of the capitalization, said the commission. Furthermore, it would seem that if a larger amount of low-cost bond money may be obtained by entering the tax benefits in restricted surplus rather than in a tax reserve that there must be a predisposition on the part of investors to consider the tax benefits as part of equity insofar as earnings are concerned.

The commission, among others, made the following findings:

(1) That the Internal Revenue Code of 1954, which became effective on Aug. 16, 1954, authorizes on the election of the taxpayer the adoption of certain methods of accelerated depreciation for the computation of federal income taxes. The three specific methods of determining depreciation for federal tax purposes permitted, are as follows:

(a) Straight line.
(b) Declining balance method.
(c) Sum-of-the-years-digits; as well as other consistent methods producing results similar to the declining balance method.

(2) That the Internal Revenue Code permits the taxpayer to adopt one of the several methods of accelerated depreciation with respect to facilities constructed, reconstructed, erected or acquired and initially used after Dec. 31, 1953. The adoption of a method of accelerated depreciation for income tax purposes will result in reducing in the early years of the life of the property certain amounts of federal income taxes with respect to the property affected. The amount and extent of such net difference in taxes will depend upon the nature and the volume of the facilities from time to time added to the taxpayer's plant, and the election of the taxpayer as to whether certain of these facilities shall be subject to accelerated depreciation.

(3) That if the applicant elects to adopt one of the methods of accelerated depreciation, it should be required to appropriately account for and to use the funds resulting from the reduction of taxes, and such funds should not be available for the payment of dividends.

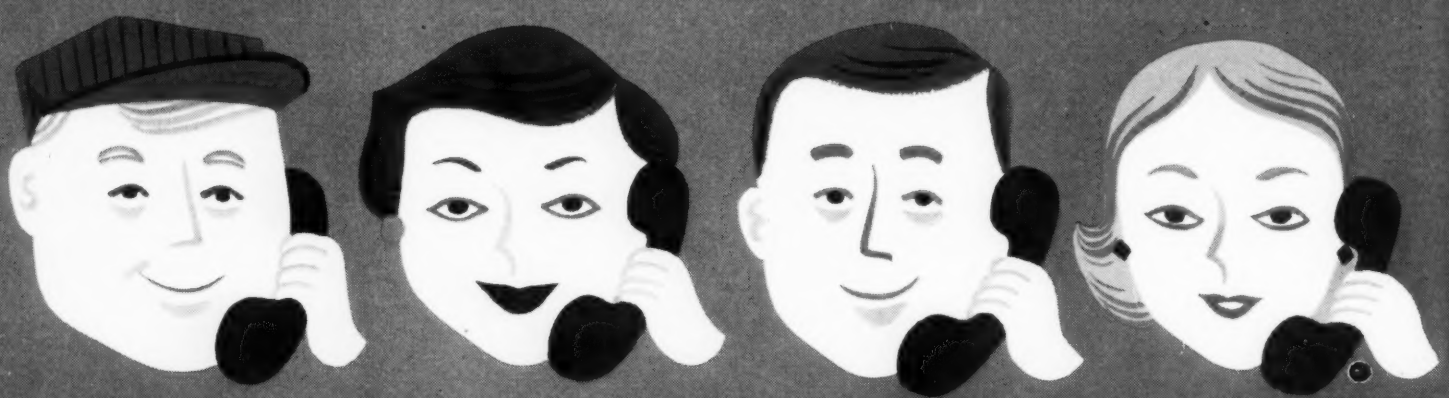
(4) That the appropriate accounting treatment is to make an additional

(Please turn to page 36)

XUM

It means so much to all...

Regular telephone calls mean a lot to families when someone is away from home. These calls mean more business for America's telephone companies, too. The advertisement across the page helps all telephone companies, with its pleasant reminder to millions of January magazine readers that "calls home" are fast and easy . . . and cost so little.



"Tell Daddy we miss him"

When one of the family is out of town, there's nothing like a regular telephone call to keep ties warm and close.

It's by far the fastest, easiest way to keep in touch . . . to share good news . . . to reach someone in a hurry. It means so much, it costs so little.

Why not call right now? It's easy – just tell the operator where you want to call: she'll be glad to help you.

LONG DISTANCE RATES ARE LOW

Here are some examples:

Cleveland to Pittsburgh	45¢
Birmingham to St. Louis	85¢
Chicago to Buffalo	95¢
Milwaukee to New York	$1.20
San Francisco to Washington, D. C.	$2.00

These are the Station-to-Station rates for the first three minutes, after 6 o'clock every night and all day Sunday. They do not include the 10% federal excise tax.

Call by Number. It's Twice as Fast.

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MACHINE PRODUCTS
COMPANY, INC.
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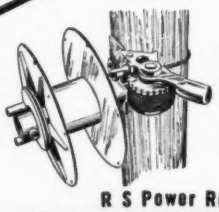
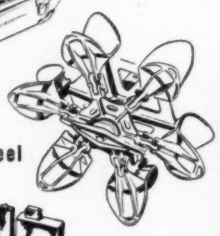
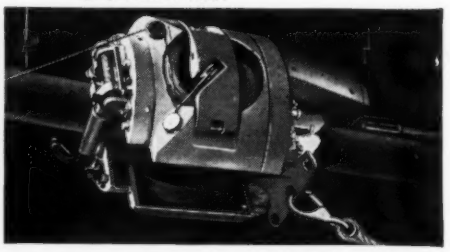
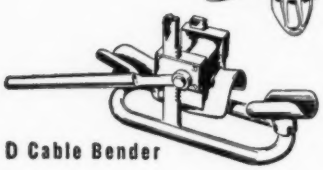
Portable & Power Reels

Pressure Testing Kit


R S Power Reel


C R Power Reel

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charge to operating expense annually in the amount by which federal income taxes for the year resulting from the election of accelerated depreciation in respect to any of its properties, is less than the federal income taxes which would have resulted had the company not elected such accelerated depreciation.

(5) That the corresponding credit in the balance sheet should be made to a reserve account for future federal income taxes.

The commission by appropriate approval, so ordered.

A number of other states have acted in cases of similar nature, approximately half favoring restricted surplus listing and the other group favoring tax reserve listing, the most recent action coming in Michigan and Illinois, which two favor the tax reserve method.

Wis. Company Asks Authority For Stock and Bond Issue

The Wisconsin Public Service Commission has announced that the Rhinelander Telephone Co. has filed an application for authority to issue $725,000, principal amount of first mortgage bonds and $200,000 par value of common stock, it was reported on Dec. 21.

The bond issue is to be sold to a financial institution and no public offering of the bonds will be made.

Of the common stock, $100,000 is to be issued and sold for cash and $100,000 is to be issued as a stock dividend. The stock to be sold will be offered to the present stockholders.

The proceeds from this transaction is to be used to retire $270,000 of present debt and to convert the present telephone system to dial service.

General of the SW Gains Rate Increases in Texas

General Telephone Co. of the Southwest, San Angelo, Tex., was granted the following rate increases in Texas during the month of December 1955:

Exchange	*Old*	*New*
Sulphur Springs, automatic, 2624 stations		
One-party business	$7.50	$9.00
Two-party business	6.00	8.00
One-party residence	3.75	4.25
Two-party residence	3.25	3.75
Four-party residence	2.75	3.25
Big Lake, common battery, 894 stations		
One-party business	6.35	7.50
Two-party business	5.00	6.00
One-party residence	3.65	4.25
Two-party residence	3.10	3.65
Lorenzo, automatic, 350 stations		
One-party business	7.50	9.00
Two-party business	6.00	7.50
One-party residence	4.25	5.00
Two-party residence	3.50	4.25

OUR AIR DEFENSE SYSTEM

Continued from page 20

on to CONAD Headquarters. Under the manual system, each of these steps is performed by some individual person. Many times one person must perform several steps. The radar operator must read a scope. Another operator plots the progress of flights on a huge plexiglass board. He may receive verbal instructions from a number of sources.

The manual system is so limited that each intercept control station can handle information from only one or two radars. To secure a picture of the air situation over a large area or even a small area, a hand-plotting job must be done at subsector headquarters based on reports from a dozen smaller stations. It is all done on a person-to-person basis.

What SAGE Can Do

Through organization and training, we have made the manual system as efficient as possible. But this is not the answer. Human capabilities are limited.

However, we felt from the very beginning—after putting many scientists to work to study the situation back in 1950 — that the problems associated with mass data processing, and simultaneous control of many weapons, could be overcome. After several years research, study, and experimentation by top-notch scientists and engineers, we believe that most of the problems have actually been solved—and that SAGE is the answer.

How the improved air defense system will operate, using the new semi-automatic devices, will be illustrated later this evening in a film called SAGE. The fundamental improvement which semi-automatic operation brings is not only greater speed, but also greater accuracy, reliability and capacity. This could never have been adequately done by manual methods. Under manual operation, the fundamental unit or building block was one radar. Under SAGE, a dozen radar can be automatically linked together to give a much more informative and comprehensive picture of the air situation. As rapidly as the air situation changes, the composite picture in subsector headquarters will change. We can control and direct many times as many weapons as heretofore.

There are many electronics devices which will bring semi-automatic operation to air defense. The brains of SAGE is the giant electronic computer. Each sector and subsector will have one. In its memory drums many facts can be stored. As new facts develop, the memory drums can be automatically kept up to date. The computer can furnish, rapidly, solutions to complicated navigational and sectoring problems. One of its greatest benefits is its unfailing accuracy.

It can furnish a correct picture at the earliest possible moment to the subsector commander. The commander must evaluate the situation and make tactical decisions. Only a computer could assess and evaluate an air situation, in relation to location and speed of defense weapons, rapidly enough to produce the one best solution.

The semi-automatic operation of SAGE also includes a new converting device which changes radar information into a signal form whereby it can be automatically transmitted and carried over Class II telephone wires. In the past, the use of telephone wires was limited to voice or teletype. This device also permits radar to function unattended, except for maintenance.

Another automatic feature of SAGE is the data link. The data link is a radio transmitter and receiver. The transmitter is on the ground and the receiver is in the airplane. This will permit the giant computer to automatically transmit weapons control and flight instructions, with all the complex coordinates and numerical readings, to direct the interceptor pilot to the enemy bomber. When an interceptor is equipped with an auto-pilot, the aircraft itself can be automatically controlled from the ground. Automatic flight control, monitored by the human pilot, is required to meet the demands for accuracy caused by jet speeds.

Our continental air defense system today is heavily dependent upon communications circuits, to tie together all elements of the continental air defense. SAGE will increase our communications needs. As the speed and complexity of weapons increase, the electronic ground environment required to operate them becomes more complex. And communications is an essential element of this ground environment.

Within the continental United States today we lease almost all point-to-point communications for air defense, and for all other domestic military operations. Our air defense communications are an integrated network. They originate from each volunteer ground observation post, and they originate from radar stations operated to detect and track aircraft. They run through the complex of direction centers and control centers to the Continental Air Defense Headquarters. This vast web of communications covers the country from coast-to-coast. It is derived through leasing circuits from the commercial telephone system of the nation.

For a quarter of a century it has been a firm policy of the military services to lease communications lines from domestic commercial telephone companies. This was not always the case, however. We arrived at this policy after years of trial and experimentation with different methods and media. For example, after World War I, the military had embarked on a policy of communications by means of their own radio networks, rather than using telephone circuits. But early in the 1930's two primary reasons influenced the abandonment of that policy.

First, the military services found that radio could not provide the same degree of flexibility and diversity of distribution that the domestic telephone commercial carriers could, with their extensive land-line networks. Such flexibility and diversity could be duplicated by the military only at an exorbitant cost in money and manpower.

Second, and equally important, was the problem of obtaining radio frequencies. They were increasingly needed by the military for overseas communications, and for other growing requirements such as the aeronautical service. Use of radio for domestic communications by the military, therefore, gave way to the leasing of commercial telephone land-lines.

To provide the telephone communications required by SAGE will require the local realignment, regrouping and augmentation of the telephone lines now utilized by air defense. But these are only the tentacles, the nerve ends we might say, in local areas throughout the United States that must be changed and augmented. The backbone of this system remains substantially unaffected.

When the concept of SAGE was developed five years ago, one of the basic assumptions tacitly made by the scientists was that such a system was feasible in the continental United States only because of the existence of a network of commercial communications land-lines that has no counterpart in any other part of the globe.

Today this network, operated by the Bell System and the Independents, represents a private capital investment of nearly 16½ billion dollars. Since 1945 it has been growing at a rate of 1 billion dollars a year. And the demand from the public for better and more extensive service indicates that this rate of growth will increase, rather

(Please turn to page 42)

BAKELITE TRADE-MARK POLYETHYLENE

MEETS VARIED FIELD CONDITIONS IN TESTS CONDUCTED BY GENERAL TELEPHONE COMPANIES

In just ten years, General Telephone System has tripled its number of telephones in service. It now serves in 30 states spread across the continent. Much of this progress has been matched by increased efficiency through the use of new equipment, devices, and materials.

As an example of this forward planning, several member companies of General Telephone System are testing wire and cable covered with BAKELITE Brand Polyethylene in various sections of the United States. This exposure to different climatic, geographical, and operating conditions points up advantages of BAKELITE Polyethylene for telephone services as indicated in the test reports in the adjoining pages.

FIELD TESTS DEMONSTRATE PROP

BAKELITE POLYETHYLENE OF INTI

FIELD REPORT FROM SPOKANE, WASHINGTON

Polyethylene-covered cable was first installed here in 1950.

Field experience showed that it was adaptable to any method of hanging and required no special equipment. Installation could be made on existing pole arms without increasing crossarms, pole height, or tree trimming.

No outside interference is apparent with polyethylene-covered wire although installations have been made near power lines and open wire.

The line has withstood extremely heavy snow and ice loading in certain mountain and valley sections. There has been no deterioration despite temperatures 40 deg. below zero.

During the summer months, temperatures up to 115 deg. and exposure to sunlight have had no discernible effect.

FIELD REPORT FROM JOHNSTOWN, NEW YORK

Most of the rural service in this section has been carried over conventional open wire lines. To increase the number of telephones, it was necessary to add more crossarms which in turn brought higher maintenance costs due to tree trimming. Also, open wires were susceptible to damage by wind, ice, and lightning.

Recently, 33,000 feet of cable and 75,000 feet of rural distribution wire, both insulated with polyethylene, were put into service. Although an unusually large number of thunderstorms were experienced during the year, no lightning damage was reported on these lines. To date, rain conditions have had no effect on any of these cables.

Much of the polyethylene cable was strung on existing poles, but in the construction of new lines it was found practical to use ⅓ fewer poles. The need for crossarms and tree trimming was also reduced.

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ERTIES AND CHARACTERISTICS OF

:REST TO TELEPHONE ENGINEERS

FIELD REPORT FROM ERIE, PENNSYLVANIA

Polyethylene has stood up under exhaustive indoor and outdoor tests carried out in this region during the past year. It has effected such savings in installation costs that it will be a major item in purchases for the coming year.

Polyethylene-covered wire is already being used in rural areas, where the need for 6-pair distribution wire has been a continual problem.

With respect to service life and safety, polyethylene is considered an outstanding improvement over other materials. It has shown unusual resistance to weather and abrasion.

The extremely light weight of polyethylene insulation permits a smaller cable construction that is easier to handle, making for faster installations. It also permits wider pole spans, with a consequent saving in poles and maintenance.

FIELD REPORT FROM SPRINGFIELD, ILLINOIS

Cable with polyethylene insulation and vinyl plastic jacketing has been used in this area since 1953. Its light weight, compared to that of conventional cable, has resulted in several economies, including a 5-ft. reduction in pole height, elimination of guy wires and messengers, faster handling of cable, less land clearing, and wider spacing of poles.

Excellent results are reported with spans of 400 feet, compared to the 240-ft. spans needed with conventional cable. The light weight and high strength of the cable assembly are particularly important in winter, lessening damage from ice and sleet loading.

Because of its high dielectric strength, polyethylene now replaces fabric insulation on circuit wiring. Tests on the cellular form of polyethylene indicate the possibility of using 26-gauge conductors where 24-gauge are now considered necessary.

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THE INSULATION FOR DEPENDABLE SERVICE EVERYWHERE

From East Coast to West, from the Gulf to the Great Lakes, member companies of General Telephone System across the country are subjecting BAKELITE Brand Polyethylene to service under a variety of tough field conditions.

The dependability of BAKELITE Polyethylene insulation for wire and cable has already been demonstrated in other fields . . for *control cables* in the operation of fire alarm, traffic, and railway signals . . in *utility line wire* and *service drop cable* . . . in *power cable* . and in *coaxial cable* for high-frequency service.

Field tests such as those described on the preceding pages demonstrate how BAKELITE Polyethylene can help in expanding and improving telephone service. To learn more about it, write Dept. MN-180.

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In Canada : Bakelite Company, Division of Union Carbide Canada Limited, Belleville, Ontario
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OUR AIR DEFENSE SYSTEM

Continued from page 37

than decrease, in the foreseeable future. As an assistance to national defense, particularly in the air defense aspects, the telephone system is becoming a greater national asset each year.

We have also estimated that by 1960 it may cost as much as 240 million dollars a year for leasing the communications facilities required for air defense. Normally, this cost of leasing is computed, as it is now for all our leased communications, on the basis of government tariff rates established in the public interest by the FCC (Federal Communications Commission) and local utilities regulatory bodies. These are applicable to rental of lines by the public in general.

The engineering of leased facilities to insure compatible operation of all elements in the SAGE system is an extremely complex job. Technical standards applicable to all elements must be rigidly adhered to. The entire web of existing communications in a specific local area must be engineered as an integrated whole. Such engineering must be carried out at one focal point for the entire system, if the system is to operate effectively. This focal point is the engineering department of the AT&T company in New York City. Participating in this effort are representatives of the associated Bell companies and a representative of the United States Independent Telephone Association. We are also encouraging coordination with manufacturers who make equipment for the Independent companies.

As the engineering for each area is completed, the installation and operation of the required leased facilities will be carried out by local telephone companies in the areas in which SAGE direction and control centers are established. All companies, associated Bell and Independents, will have an opportunity to provide the leased circuitry required for SAGE.

At present, the Air Force is leasing lines for all military purposes from about 600 telephone companies, 20 of which are Bell System and 580 are Independents. For SAGE, nearly every corner of the country will be involved. Obviously, a great many telephone companies will participate. The number of companies participating cannot be predicted at this juncture. However, all the telephone companies of the nation are protected by franchises covering the areas they serve. Any company affected by SAGE will, therefore, have an opportunity to provide circuits required in its area. A waiver in favor of another company can be made only if the franchise holder volunteers it.

One last word about leased communications. I would like to stress that the communications lines required for SAGE will, in general, not be newly constructed in their entirety. The major portion will be derived from the vast network of commercial communications lines presently in existence. The value of these new extensions lies in the fact that they will be engineered and built to integrate with the over-all telephone system of the country. Only by this can we get the quality, flexibility and reliability of service required.

I would also like to stress that we are counting on teamwork and support of this program from all parts of our vast telephone system, including the many equipment manufacturers which serve that system. Our experiences in the past indicate clearly that such teamwork will be readily available. Also our specific discussions with both Bell System people and representatives of the Independent telephone association indicate that the service we need for SAGE will be provided.

A Specific Definition of SAGE

Before turning to our program for implementing SAGE, I would like now to give you the specific definition of this project as we use it in our daily work.

The SAGE System is that portion of the air defense system that provides the means for the semi-automatic processing of data and weapons control. It consists of:

(1) Facilities to transmit air surveillance data from data-gathering sources to Direction Centers.

(2) Direction Centers, where air surveillance data is evaluated and developed into air situations, and from which weapons assignment and guidance is generated.

(3) Facilities to transmit situation data from Direction Centers to Combat Centers.

(4) Combat Centers, where data is evaluated and developed into broad sector situations, from which weapons resources can be monitored.

(5) Facilities to transmit instructions from Combat Centers to Direction Centers.

(6) Facilities to transmit the instructions from Direction Centers to users such as CAA, FCDA, and various weapons units.

You can see that the heart of the SAGE project is the direction center building which houses the computer and the "black boxes" which feed information to it. A second major part of SAGE is the leased communications circuits which connect the rest of the air defense activities to the computer building. The third, and much smaller part of the project, is the equipment at the radar or other sites which convert the raw data into a form which the leased circuits can handle.

The equipment at each subsector for the most part will be housed in a concrete blockhouse building, which must all be especially constructed for this purpose. It will be windowless, must be air-conditioned for technical reasons, have special heat-dissipation equipment; besides, it must have special lighting, and special dehumidifiers. Each blockhouse will cost about 3½ million dollars. In addition, each one must have an ancillary power building. The power building, however, will not have the technical requirements of the main building and will cost much less.

Our biggest problem in SAGE, next to devising and testing the system itself, is the problem of successfully building, engineering and installing the equipment. A basic requirement, of course, is that the finished product will have a high level of operational reliability.

There are several types of complex electronic equipment in SAGE. Three have already been mentioned—the computer, the radar converter and the data link. There also is monitoring equipment which continuously checks on unattended radar miles and miles away to see that it is functioning properly. At the radar sites special equipment will automatically transmit the converted radar data over telephone lines. And there are many other lesser equipments both at the radar site and at the control center. The coordination of these equipments is a major engineering feat.

The Air Force has been confronted with similar tasks in our aircraft and missile programs. As many of you already know, we have solved them by applying what we call weapons system management. This type of management uses a major contractor to coordinate and integrate the engineering and production details of the complete aircraft or missile.

For example, we have used this method in the B-52 with Boeing as the systems contractor and in the F-102 with Convair. Now for the first time we are using the weapons systems approach to a major ground supporting system. We have selected a weapons systems contractor for SAGE — that contractor is the Western Electric Co.

However, it is really the total resources of the Bell System we are hiring for this purpose—Western Electric

is merely the contracting agent as is the case customarily in contracts involving the Bell System.

Now, using a weapons system contractor does not mean that other companies do not take part in the program. Actually, the major items of equipment, which dollar-wise represent the most significant portion of the SAGE system, are procured from several other manufacturers on prime Air Force contracts. In addition to this, many, many sub-contractors share in the job of building equipment for SAGE. A good proportion of these sub-contractors fall into the category of small business.

In addition, the large task of erecting the specialized building for the computer will be contracted, in most cases with local construction companies under bidding procedures normally used for Air Force construction. From a purely financial point of view, it is wrong to assume that the weapons system contractor for SAGE gets a lion's share of the business. Specifically, for management services, the weapons system contractor will receive only a very minor per cent of the total cost.

On the Air Force side, the SAGE project is managed by a Joint Project Office (JPO)—just as we do for aircraft projects. This office is set up in New York City and is the focal point for management of the task of building the SAGE direction centers. The Air Material Command exercises command control over this JPO—however, representatives of the Air Research and Development Command are full time members of the JPO staff. Other agencies having a vital interest in SAGE, such as CONAD and our Air Force installations representatives, are represented by full-time liaison officers.

The management provided by our JPO is not just passive monitoring of the prime contractor's work. It is instead a very active daily control of the salient points in the project. Our main purpose in using the weapons systems contractor is to help him provide the over-all integration needed in complex engineering jobs.

However, we recognize the Air Force responsibility for insuring that our equipment procurements are operationally useful and obtained economically. So we provide the controls necessary for this in the JPO.

One aspect of SAGE is misunderstood frequently. Although we are leasing the communications circuits for SAGE—we are not leasing the other parts of SAGE. When the direction center buildings, with its computer and other equipment, are completed, they will be U. S. Government property.

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Summary

Let me emphasize, in closing, that SAGE actually is not a new air defense system. It is merely the modernizing of our existing system by introducing semi-automatic operation. This is accomplished by many electronic devices, by far the largest and most complex being the electronic computer. This computer is of such a nature that a special building with special atmospheric conditions is necessary for its adequate functioning. This building, including installed equipment, will be U. S. Government property. Over 600 separate communications lines must enter this building, tying it to many radar, to many other information sources, and to other control centers. These communications circuits will be leased from the appropriate franchise holder.

Constructing the SAGE system is one of the largest electronic systems we have ever attempted. The Air Force, in order to control it, has selected the weapon system type of management. This type of management has already proven successful in our aircraft and missile programs. This is the first time this type of management has been applied to a ground system. We are confident that this approach will give this country a reliable, major improvement in our air defense. And it will do it in the shortest possible time, at a minimum cost for quality workmanship.

IN THE NATION'S CAPITAL

Continued from page 22

which will provide any communications facilities required in connection with SAGE—each operating telephone system (whether co-op, Independent, or Bell) providing the service within its own operating area.

Communications Excise Taxes

The recent report on the general subject of excise taxes of the joint staffs of the Joint Committee on Internal Revenue Taxation and Treasury Department has been sent to the House Ways and Means Committee. It touched on a number of items now taxed in this category. With respect to taxes on telephone communications (now taxed at the rate of 10 per cent on both monthly bills and long distance tolls), the joint staffs agreed that a "study should be made of the communications taxes to determine whether they should be revised substantially to conform to modern techniques and to remove any competitive problems which may exist."

The text of the joint staffs' report dealing with this subject is:

"Communications Taxes.—The Treasury and Joint Committee staffs at this time are not able to make any joint recommendations in the area of the communications taxes. A large amount of valuable material bearing on possible changes in these taxes has been received only quite recently, and it has not been possible as yet to adequately examine the suggestions.

"The staffs agree that, if possible, it would be desirable to revise substantially the basis of these taxes in order to simplify and consolidate them, to bring them more in line with technical advances which have occurred in recent years, and to remove competitive problems which have developed since these taxes were last reviewed.

"If it meets with the (House Ways and Means) subcommittee's approval, the staffs will set a joint group to study these taxes and report back later this year."

In other words, it would appear that the joint staffs are not ready at this time to recommend any changes in telephone or telegraph excise taxes, but that questions have come up and information has been developed suggesting the possibility of changes. Probably the House Ways and Means Committee will authorize the special study on this subject requested by the joint staffs, and more will be heard on the subject from that source during the current year.

It is understood that Western Union, among others, has been complaining that it is discriminated against by certain provisions of the present law. Dan Throop Smith, Assistant to the Secretary of the Treasury, told the committee that such a study could be completed "in a very few weeks."

Federal Pay Raise

Unless the Senate slips up on it, Uncle Sam will probably soon do something about increasing the pay of federal executives. These include members of the Federal Communications Commission, Federal Power Commission, Federal Trade Commission, Securities & Exchange Commission, and the Administrator of the Rural Electrification Administration.

For many years these hard working officials have been notoriously underpaid—considering the high degree of qualification required and the serious responsibilities and extensive duties involved. At present, for example, the members of the Federal Communications Commission are getting only $15,000 a year. Not long ago they were getting only $10,000 a year.

Under the House-approved bill

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(H. R. 7619) all of these officials, including both the FCC and REA administrator, will get an annual rate of basic compensation of $19,000 a year. In addition the chairman of each of the regulatory commissions will get an extra $500. Thus the chairman of the FCC, for example, will get $19,500 if the Senate approves the House bill.

There was some political opposition to other sections of the bill which are very broad and include a great number of federal officials' salaries. But there seemed to be little opposition in Congress to raising the salaries of the regulatory commissions.

Footnote on Peron

A recent dispatch from Buenos Aires throws an interesting sidelight on the state-owned telephone system as it was operated, until recently, in Argentina under the dictatorship of the deposed President Juan Peron. The communications minister of the provisional government of Argentina, Luis M. Igartua, announced that a new state-owned corporation has been formed to operate the telephone system. The purpose is to put the system on a self-supporting basis.

It was during Peron's administration that the government bought the telephone system from the International Telephone & Telegraph Co. for approximately 100 million dollars. As of last Dec. 31, the state telephone administration had an accumulated deficit of more than 40 million dollars. The new autonomous Argentina state telephone corporation will also take over the telegraph system, which has been operated under the Post Office Department.

Independent in Iowa Announces Rate Raise

Directors of Citizens Mutual Telephone Co., Bloomfield, Iowa, on Dec. 24 announced the following changes in rates, effective Jan. 1:

	Old	*New*
One-party residence	$3.00	$3.50
Two-party residence ...	2.00	2.50
One-party business	3.75	4.25
Rural multi-party	2.00	2.50

Higher labor and materials costs were given as the reason for the increases.

Sale of Alabama Company Authorized by Commission

Sale of the Camden Telephone Co., now owned and operated by T. O. Crutchfield, has been authorized by the Alabama Public Service Commission, it was reported on Dec. 27.

Purchaser will be the Southland Telephone Co., of Atmore. W. F. Corman is general manager of the company.

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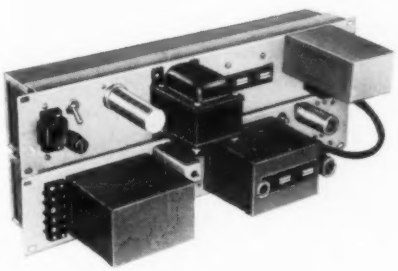
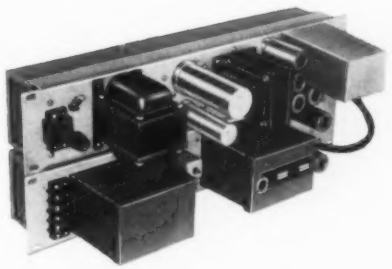


Central Office Terminal



Subscriber Terminal

. . . Gives you these advantages

Provide service for waiting-list customers adjacent to lines now filled to capacity.

Reach potential customers beyond the end of present lines, without the cost of new construction to that point.

Provide private, two-party or four-party lines not now available, with resulting improvement in rate earnings.

Free physical circuits for paystations or other special revenue telephone service now blocked by lack of capacity.

Meet demands for special temporary service, such as resorts, construction camps, etc., where carrier can be moved to meet changing requirements.

Offer improved service to customers now on overcrowded lines.

Technically explained and illustrated in BULLETIN C-541

FOR FURTHER INFORMATION WRITE FOR BULLETIN C-541

BUCKEYE TELEPHONE & SUPPLY CO.

1250 KINNEAR RD. **COLUMBUS 21, OHIO**

XUM

CUT COSTS

WITH TIMESAVING

GREENLEE TOOLS

...push pipe underground with a
GREENLEE PIPE PUSHER

Here's the quick, simple way to install underground pipe. With the GREENLEE Pusher *one man* pushes pipe *under* streets, walks, railways, lawns, flooring. No tearing up of pavement...eliminates extensive ditching, back-filling, tamping, tunneling, repaving. Cuts job time to a fraction. Two models to fit your jobs exactly—hand or power-pump operated.

Other GREENLEE tools for telephone work . . .

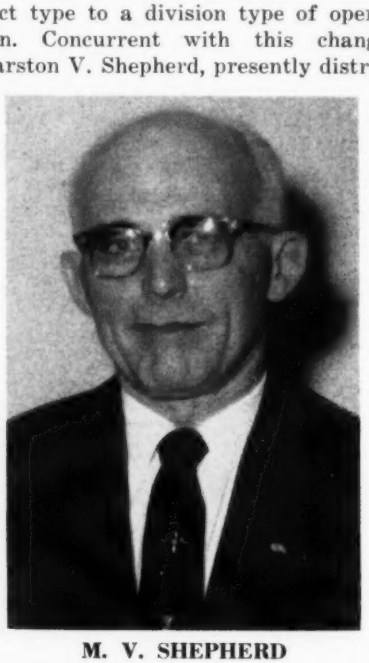
Do the job faster, better with high quality GREENLEE Car Bits for pole work . . . Electricians' Auger Bits of special design for electrical installation work . . . Bell Hangers' Drills of the "Feeler Bit" type . . . Expansive Bits for boring ½" to 4" holes . . . and GREENLEE Angle-Screw Drivers which eliminate pre-boring for angle-screw installations.

MACHINERY & TOOLS
GREENLEE

Get facts on timesaving Greenlee tools. Write Greenlee Tool Company, 2061 Columbia Ave., Rockford, Illinois.

General of Kentucky Adopts Division-Type Operation

H. J. Heuther Jr., president, General Telephone Co. of Kentucky, announced on Jan. 5 that effective Feb. 1, 1956, his company would change from a district type to a division type of operation. Concurrent with this change, Marston V. Shepherd, presently district



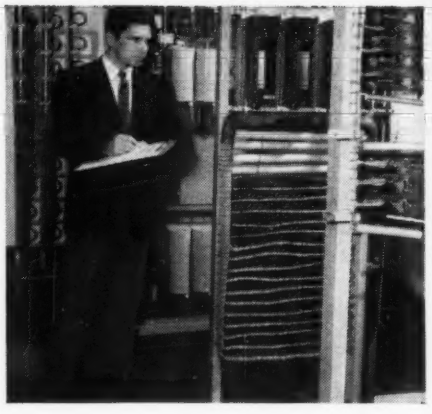
M. V. SHEPHERD

manager at Ashland, Ky., will become Lexington division manager with headquarters at Lexington, Ky., and James F. Wibbeler, now Ashland district plant supervisor, will be Ashland division manager with headquarters at Ashland.

J. F. WIBBELER

The Lexington division will consist of the following exchanges, Lexington, Berea, Bryantsville, Hazard, Liberty, Lancaster, Midway, Nicholasville, Paint Lick, Versailles and Wilmore with a total of 49,345 stations.

The Ashland division will be made up of the following exchanges, Ashland, Catlettsburg, Russell, Morehead, Flemingsburg, Sharpsburg, Poplar



American Appraisals of reproduction cost may affect rates

An American Appraisal report of the cost of reproduction provides convincing evidence in the preparation of an appeal for adjusting rates to provide a more equitable return.

The
AMERICAN APPRAISAL
Company
leader in property valuation
HOME OFFICE: MILWAUKEE 1, WIS.

Haley's
CEDAR POLES
and FIR CROSS ARMS
LOW CONDUCTIVITY AND SAFER WITH PENTACHLOROPHENOL FULL-STRENGTH TREATMENT
CLEAN • DRY
LONGER LIFE
LIGHT WEIGHT
2 YARDS
MINNEAPOLIS
FINDLAY, OHIO

R. G. HALEY & CO.
SPITZER BUILDING
TOLEDO 4, OHIO

Plains, Vanceburg, Owingsville, Grayson, Olive Hill and Greenup, with a total of 23,529 stations.

Mr. Shepherd began his telephone career with General Telephone Co. of Kentucky as Ashland area commercial manager in September 1948. He was appointed Ashland district manager in November 1951, when the type of operation was changed from area to district.

Mr. Wibbeler started his telephone work with the company in September 1946 as a combinationman and has progressed through the ranks to his present job.

D. R. NOBLE

David R. Noble, district manager at Morehead, will assume the position of Ashland division plant superintendent, effective Feb. 1. Mr. Noble is a veteran of 15 years of service with General of Kentucky. He served 4½ years in the Army Air Force during World War II.

Nebraska Independent's Stockholders OK Sale

Stockholders of the Speiser (Neb.) Telephone Co. on Dec. 27 voted 46-to-29 to approve sale of the company to The Lincoln (Neb.) Telephone & Telegraph Co.

The Speiser company serves 130 telephones which are to be served by the Humboldt exchange of the Lincoln company if the commission authorizes the sale.

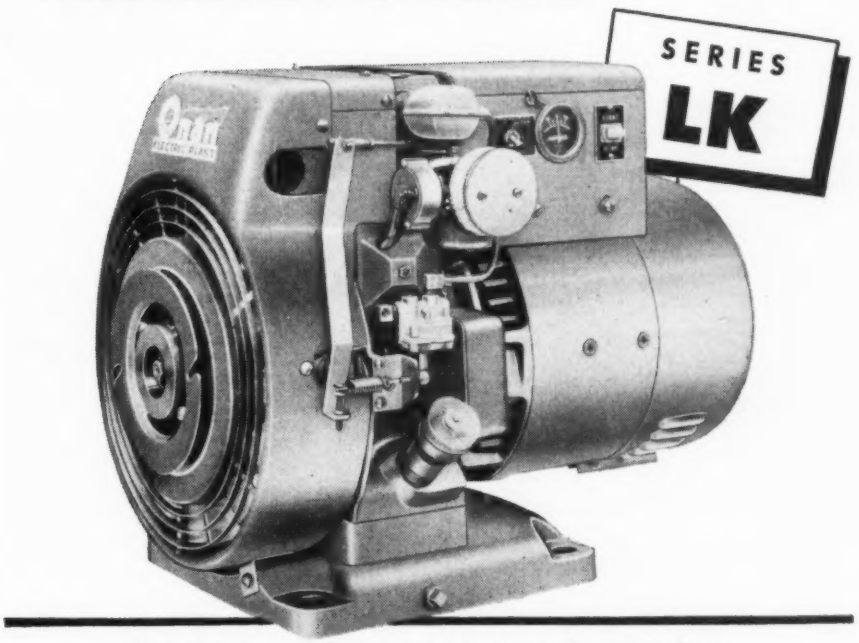
Barriers to Investment

"We face the necessity of urging the federal government to remove or lessen those formidable investment barriers—high progressive income taxes, capital gains, and the double tax on dividends—that destroy incentives for individual investment."—KEITH FUNSTON, *president, New York Stock Exchange.*

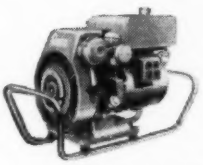
RUGGED

is the word for this

New ONAN 2-KW Electric Plant

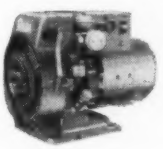


Put it to work on your toughest jobs!



PORTABLE POWER

Stands up better under rough handling. Carrying -frame or 2-wheel dolly optional.



PRIMARY POWER

Runs longer in continuous day-after-day service. Dependable, economical.

A dependable source of electricity for emergency standby use

Built to do the job where other units won't stand up! This new 2,000-watt, A.C., 115 or 230-volt, gasoline-driven Onan plant can take all kinds of punishment and come back for more. It's powered by a husky, Onan 4-cycle, single-cylinder, engine with Stellite-faced rotating exhaust valve, larger longer-wearing bearings, and efficient, trouble-free air-cooling. The Onan-built generator is direct-connected, permanently aligned, and fully-protected for use under all climatic conditions.

The Onan "LK" is compact too . . . requiring less than 3 square feet of floor space. Heavy-duty construction throughout . . . yet it weighs only 235 pounds. In carrying frame or dolly-mounted it can be taken anywhere and is easily moved around on the job.

The rating of 2,000 watts is conservative, allowing ample overload. Fuel consumption at full rated load is less than one quart of gasoline per kilowatt hour, making the "LK" a low-cost source of primary power. Recoil rope starter on models for portable use; electric starting available for stationary installations; automatic controls for emergency standby use.

Wide range of accessories available

Write today for special "LK" folder!

Onan ELECTRIC PLANTS

D. W. ONAN & SONS INC.

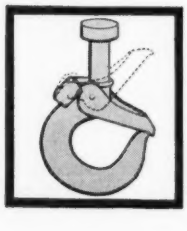
3864 UNIVERSITY AVE. S.E. • MINNEAPOLIS 14, MINNESOTA

XUM

Here's the safest ratchet lever hoist ever invented!

It's the original Coffing Safety Pull, a ratchet lever hoist that cannot drop its load, spin out of control should operator's hand slip from handle or handle break due to overloading. Dual pawls and ratchet keep load from slipping, safety stops prevent spinning; if overloaded, "safety valve handle" will bend before any other part of hoist fails.

The ¾-ton model (illustrated) weighs but 14½ lbs. *Fifteen other models available handling up to 15 tons.* Ask your recognized distributor or write for bulletin SP, Coffing Hoist Division, 808 Walter St., Duff-Norton Company, Danville, Ill.



The exclusive, cadmium plated *Coffing Safety Hook* with spring actuated locking latch designed to shed, not snag, on wires or other objects is available for the ¾-ton, 1½-ton and 3-ton models at slightly additional cost.

Coffing Hoists

Loomis to Merge With General Directory Co.

The board of directors of General Telephone Directory Co. and of Loomis Advertising Co. have agreed to integrate Loomis Advertising Co.'s telephone directory activities with General Telephone Directory Co.

Frank Davies, who had been president of General Telephone Directory Co., was elected chairman of the board. Wesley H. Loomis III, who had been president of Loomis Advertising Co., was elected president of General Telephone Directory Co. Everett N. Morningstar, who had been vice president and general manager of General Telephone Directory Co., will retire from active management but will be available for consultation as needed.

It is anticipated that Warren A. Rolph, who had been general sales manager of General Telephone Directory Co., will be elected a vice president of the integrated company. It is also anticipated that Roland T. Beard, who is vice president and general manager of the telephone directory activities of Loomis, will be elected a vice president of General Telephone Directory Co.

Mr. Loomis graduated from Massachussetts Institute of Technology in 1935, started his telephone career with Automatic Electric Co., and was elected president of Loomis Advertising Co. in 1946.

During World War II he was a lieutenant colonel in the United States Army. He makes his home currently in Kansas City, although with his new assignment Mr. Loomis will move to Chicago.

W. H. LOOMIS III

The telephone directory activities of Loomis Advertising Co. cover parts of 20 states, serving about 260 telephone directories for the Independent telephone industry. After the integration, General Telephone Directory Co. will offer complete directory service to more than 800 directories in 32 states. General Telephone Directory Co., with headquarters at Des Plaines, Ill., is part of General Telephone System.

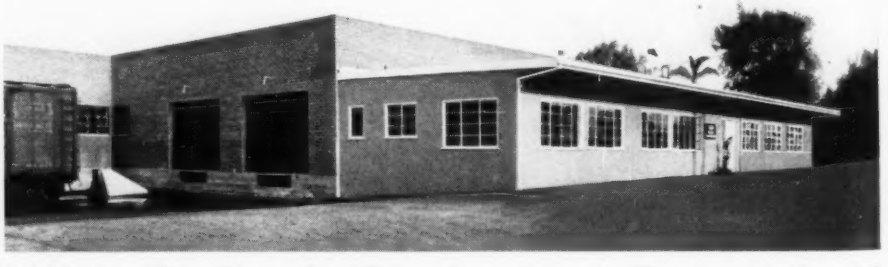
Leich Sales Corp. in New Cal. Office and Warehouse

The western sales office and warehouse of Leich Sales Corp. recently were moved to a new building in West Los Angeles, Cal.

According to D. C. Gibson, president, this newly constructed Leich building is a one-story, all-brick structure containing 15,000 square feet of floor space. It is located at 11401 W. Pico Blvd.

It is planned that this warehouse will carry a complete stock of telephone equipment and supplies. In addition to telephones and standard supply items, Leich intends to stock larger equipment for the convenience of its customers. Among the equipment items which will be available for prompt shipment are Electronic Secretary telephone answering machines, cable spinning machines, aluminum telephone booths, plastic cable and paystations.

Telephone companies in Arizona, Oregon, Utah, Washington, Nevada, Idaho



Leich's new West Coast sales office and warehouse in West Los Angeles, Cal.

and California will be served by this branch.

The new building is equipped with modern facilities for materials handling. It is on a direct railroad siding, so carload quantities can be promptly put in stock.

Robert Sanders, western district manager for Leich, is in charge of this office.

Stromberg Names Hafstrom Marketing Manager

William F. Hafstrom has been appointed manager—marketing, government contracts division of Stromberg-Carlson, a division of General Dynamics Corp., it was announced on Jan. 5 by Sidney R. Curtis, vice president, government contracts.

W. F. HAFSTROM

In this capacity Mr. Hafstrom will manage the marketing activities of the government contracts division, and will coordinate the marketing policies of Stromberg-Carlson relative to the government, Mr. Curtis said.

Mr. Hafstrom joined Stromberg Carlson August 1, 1955. Previously he had been with the General Electric Co. in Utica, N. Y., for 12 years, first as a sales engineer and later as manager of sales of the light military electronic equipment department.

Mr. Hafstrom was born in Duluth, Minn., but moved to Neenah, Wis., in childhood, and lived there until 1939. He was graduated from the University of Wisconsin with a Bachelor of Science degree in Electrical Engineering in that year.

Mr. Hafstrom is a member of the Institute of Radio Engineers, Institute of Naval Engineers, Air Force Association, and Armed Forces Communications & Electronics Association.

- **Time Tested, Proven, Accepted**
- **Used by Public Utilities Everywhere**
- **Operates on Any Derrick Truck**
- **Nationwide Sales-Service Facilities**

Rugged construction from hardened steel auger to power take-off lets this time-tested Tel-E-Lect Pole Hole Digger work in all soil conditions . . . smart design lets Tel-E-Lect's digger reach up on hills, down into ditches, or across obstacles—anywhere up to 20 feet behind the truck!

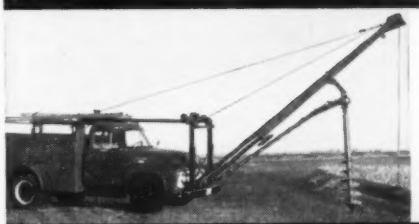
Put this low cost, industry accepted unit on the front or rear of your utility truck . . . see your two-man crew dig a hole and set a pole in less than five minutes. The Tel-E-Lect digger will bore clean holes 10 feet deep. Interchangeable augers 8″ to 20″ in diameter are offered.

The digger is lifted by truck's boom and winch. Engine power is delivered to the digger through a telescoping drive shaft and the auger can be rotated in either direction by shifting the PTO.

All Tel-E-Lect products are sold and serviced through a nationwide distributorship plan. You'll find your local dealer listed under "Trucks-Equipment" in the yellow pages, or *write direct for complete information.*

This 2-man utility truck is completely equipped by Tel-E-Lect. Its derrick and digger are stowed overhead for travel.

Once on the job, the derrick and digger are raised automatically with the winch . . . no need for a big crew with this compact unit.

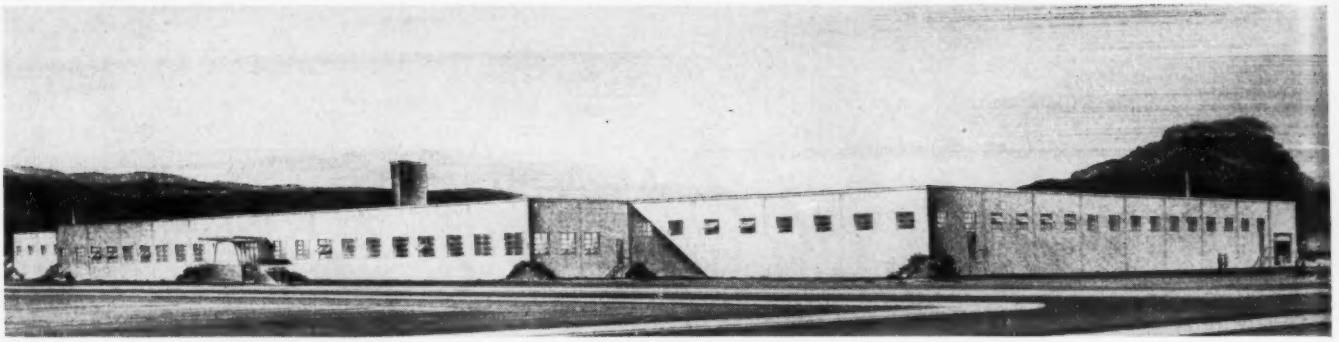


In two minutes the Tel-E-Lect derrick and digger are in position, ready to work. Note that the pole is used as additional weight to force the auger into the frozen ground.

Tel·E·Lect PRODUCTS, INC.

10,007 Minnetonka Boulevard • Minneapolis 16, Minnesota

XUM



The Ansonia Wire & Cable Co. has announced it will move to a new plant now under construction at Ashton, R. I. (architect's conception above). Construction is scheduled to be completed by Mar. 31 and all operations are expected to be under way at the new location in early April. The new plant will have 113,000 square feet of manufacturing area plus 11,000 square feet of office space. The building is being constructed by the lift slab method, wherein the concrete walls are poured horizontally, cured and lifted into position. All columns and beams will be of pre-stressed concrete. A railroad siding will be adjacent to the storage and shipping area. The new building is the result of over five years of planning. It will provide a modern layout for the manufacture of plastic-insulated and jacketed wires and cables for telephone, railroad, public utility and shipboard installation. Considerable new equipment will be provided for the manufacture of all Ankoseal products, the company announces.

Pyrene-C-O-Two Corp. Formed in Merger

Solomon R. Baker, chairman of the board and president of Pyrene Mfg. Co. and its wholly-owned subsidiary, C-O-Two Fire Equipment Co., announced a merger of the two companies and the adoption of a new name, Pyrene—C-O-Two Corp., effective Dec. 30, 1955.

This corporate merger of two of the best-known names in fire protection equipment, Mr. Baker said, has been preceded by unification of research, engineering, manufacturing, sales and most administrative functions over the past year.

The company's general offices and main plant are in Newark and other plants and offices are in Chicago and Los Angeles. Additional sales and engineering offices are in Atlanta and Dallas.

Mr. Baker pointed out that the merger puts the country's most complete line of fire protection equipment under one company name and management. Pyrene, established in 1907, produces principally vaporizing liquid, soda-acid, water, and chemical foam fire extinguishers, and air foam fire extinguishing systems. C-O-Two, established in 1925 and affiliated with Pyrene in 1933, produces carbon dioxide and dry chemical fire extinguishers and fire extinguishing systems, as well as smoke and heat fire detecting systems including the recently perfected radio-active Pre-Detector System. The corporation will continue the Pyrene and C-O-Two brand names.

Officers of the parent corporation

FOR LOW-COST, ACCURATE MEASURING

EMPLOY A

ROLATAPE

MEASURING WHEEL!

Model "400"

MODEL "400" This Model is a favorite and is widely used by Telephone Companies and other Utilities, paving contractors, land appraisers, etc. Its four-foot circumference measuring wheel makes it most suitable for measuring fairly rough terrain. Automatic measuring counter can be reset at any distance. Folds compactly.

MODEL "200" A popular Model for interior and exterior use. Tabulates wall-to-wall, vertical, or a 101 other measuring assignments. Folds compactly for kit or glove compartment.

MODEL "600" For cross country acreage measurement and work on rougher terrain.

NOTE—All Rolatape Models are designed to tabulate accurate measurements, and are constructed for long and dependable service. With Rolatape, you measure as you walk.

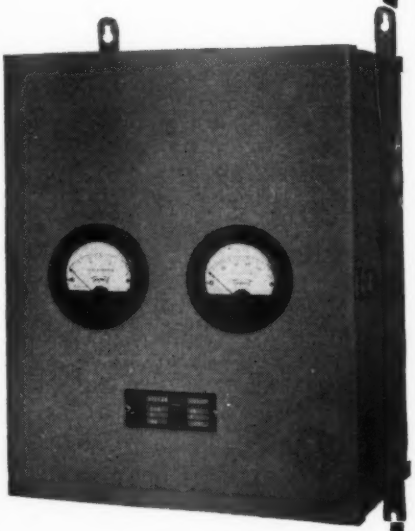
FOR COMPLETE ROLATAPE INFORMATION AND PRICES PLEASE WRITE

ROLATAPE, INC.
1741 14th Street, Santa Monica, Calif.
OR SEE YOUR LOCAL DEALER

John H. Gustafson, Automatic Electric Co. labor relations manager, has retired after more than 45 years service. He started in 1910 as an installer, and since then has held a wide variety of positions. In 1944 he was promoted to the position of factory superintendent, was named to his present post in 1954.

Dependable Power

for Years-
and Years-
and Years-
of Service!



SCHAUER
ELECTROX
BATTERY ELIMINATORS
BATTERY CHARGERS

In sizes and capacities to meet every telephone power requirement.

See your Schauer Jobber.
Write for Bulletin 1465.

RECTIFIER DIVISION
SCHAUER
MANUFACTURING CORP

4514 Alpine Ave. Cinn. 36, Ohio

remain the same: Mr. Baker, board chairman and president; Maynard A. Laswell, executive vice president; Frank B. Allen, Luis E. Eckelmann, Frederick G. Davison, William Horowitz and Arthur F. Ratzer, vice presidents; Louis Levine, treasurer; Bernard S. MacCabe, secretary; and Ralph F. Batch and Charles S. Duncan, assistant secretaries.

W. M. Dusenberry Appointed Line Material Sales Head

Wilson M. Dusenberry has been appointed sales manager of Line Material Co., according to Earle W. Williams, L-M's new vice president of marketing and sales. Mr. Dusenberry takes over the position formerly held

W. M. DUSENBERRY

by Mr. Williams. He assumed his new duties on Jan. 1 in the company's main office in Milwaukee.

Prior to his promotion, Dusenberry had been division manager of L-M's southwest division with headquarters in Dallas. He joined L-M as a field engineer in 1944 and served in the Mountain States division. He was promoted to division manager in 1948. Dusenberry is a licensed professional engineer and a member of AIEE.

A Look Into the Future

"But even if we look ahead to the time when atomic power will be starting to play the great part for which it is destined, its role, as we see it today, will primarily be the production of low-cost electricity. While atomic power plants may displace a certain amount of heavy fuel, low-cost electricity spells increased productivity, which in turn will create greater demands for petroleum products."— J. H. LOUDON, *general managing director, The Royal Dutch Petroleum Co.*

Crapo
HTL-135
INDIANA STEEL & WIRE CO.
MUNCIE, INDIANA U. S. A.

LOWER
Cost Per Mile

● Efficient rural telephone circuits can be built at minimum overall cost where *Crapo* HTL-135 High-Tensile Line Wire is used to full advantage. For *Crapo* HTL-135 makes possible spans up to 350 feet in heavy, 540 feet in medium and 650 feet in light loading districts. Longer spans mean fewer pole structures with substantial savings in material and labor costs per mile.

The rugged tensile strength of *Crapo* HTL-135 and its heavy galvanized coating provide dependable and economical service life on typical rural lines.

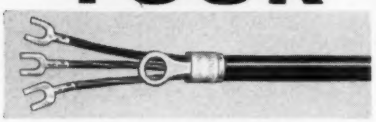
Ask your jobber for details or write direct for engineering data!

INDIANA
STEEL & WIRE COMPANY
Muncie, Indiana

CORDS BY Runzel

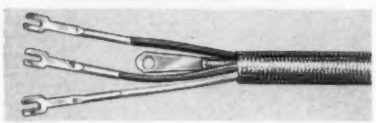
YOUR

NEOPRENE



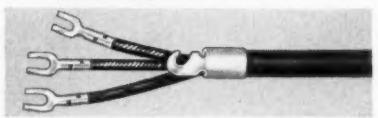
BEST

NYLON



BUY!

COTTON



Are you familiar with the features of these fine cords?

NEOPRENE covered cords are a highly serviceable cord, extensively used in a wide variety of services. They are moisture and grease proof . . . easy to keep clean.

NYLON covered cords are a relatively new development in telephone cords. Their fine smooth texture makes them the preferred cords for switchboard use. They give long service. Preferred by operators because of their fast, easy handling.

COTTON cords are in standard use everywhere. Their fine woven wrap makes them very serviceable for all around purposes.

Take your choice—Neoprene, Nylon or Cotton. They're all high quality cords made in accordance with Runzel high standard of quality. We carry a large stock of cords for every purpose.

Our geographical location means QUICK SERVICE.

RUNZEL
Cord and Wire Co.
4723 W. MONTROSE AVE.
CHICAGO 41, ILL.

The Cleverly Electrical Works, Inc., manufacturers of electrical specialties, on Jan. 16, 1956, moved offices and factory to newer and larger quarters (shown above) at 5312 Westminster Ave., Philadelphia 31, Pa.

Executive Appointments Announced by IT&T

The following appointments were made at a meeting of the board of directors of International Telephone & Telegraph Corp. for two of its divisions, Federal Telephone & Radio Co. of Clifton, N. J., and Federal Telecommunication Laboratories of Nutley, N. J., it was announced on Dec. 29, 1955 by IT&T President William H. Harrison:

Andre G. Clavier, a technical director in charge of FTL's commercial research and development program, is now vice president in charge of the same work.

Brig. Gen. Peter C. Sandretto (U. S. Air Force Reserve), formerly assistant vice president of FTL, is elected vice president, continuing the direction of military research and development.

Dudley M. Day, who has been secretary, treasurer and counsel for FTL, has also been named vice president of the laboratory division.

It was also announced that Joseph A. Frabutt, newly appointed vice president in charge of FTR's Pacific division in Los Angeles, Cal., will assume charge of all operations and production at the new factory being built there for the Pacific division (TELEPHONY, Dec. 31, 1955, p. 31). The first unit of the new plant is scheduled for completion early this year.

Answers to Questions On Page 23

(1) Carry forward the following tickets:

(a) those on which further attempts are to be made during the night or which are awaiting a WH report.

(b) those which are to be tried on a future day.

(c) those endorsed "hold for ag" or "hold for WH."

(d) those on which the calling telephone did not answer, the calling line was out of order, or the calling party was not available.

(2) Yes. Enter it, encircled, under the last entry.

(3) After you have passed the call to the TTC operator or have dialed the called number, as soon as you ascertain that ringing has started at the called telephone, ring the calling telephone, or if you are holding the line on a ringdown trunk, reach the ringdown office and say "Ring (calling number)."

(4) Yes, permit her to do so.

(5) Yes, and give any assistance required in starting conversation between the operator and the customer.

Construction Crews Station Installers
Central Office Installations
Cable Splicers Complete Engineering

HENKELS & McCOY
6100 North 20th Street Philadelphia, Pa.
Now Operating in 22 States
OFFICES LOCATED AT
ELKHART, IND.
ERIE, PA. PEKIN, ILL.
NORWALK, OHIO PADUCAH, KY.
LANSING, MICH. SUMTER, S. C.
PERFORMANCE Has Built Our Business

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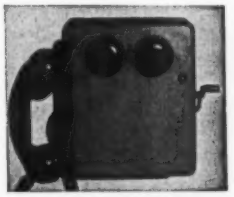
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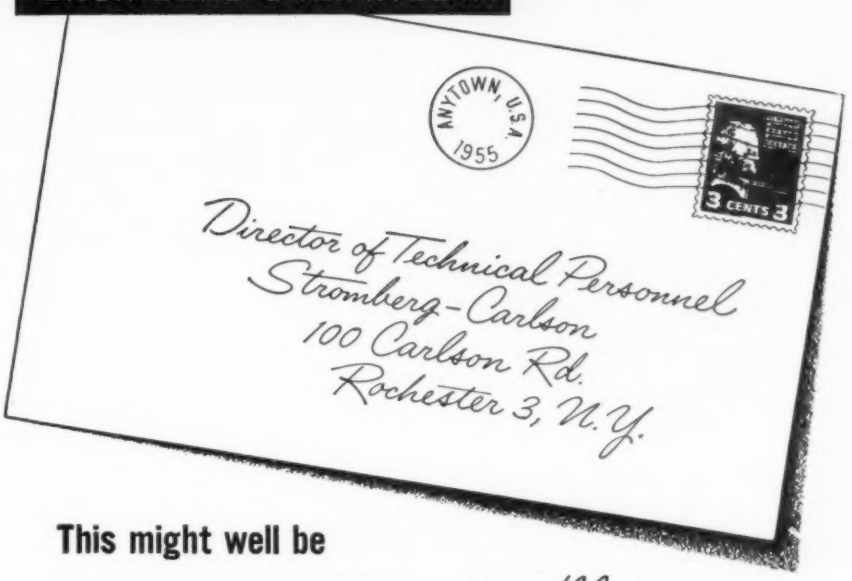

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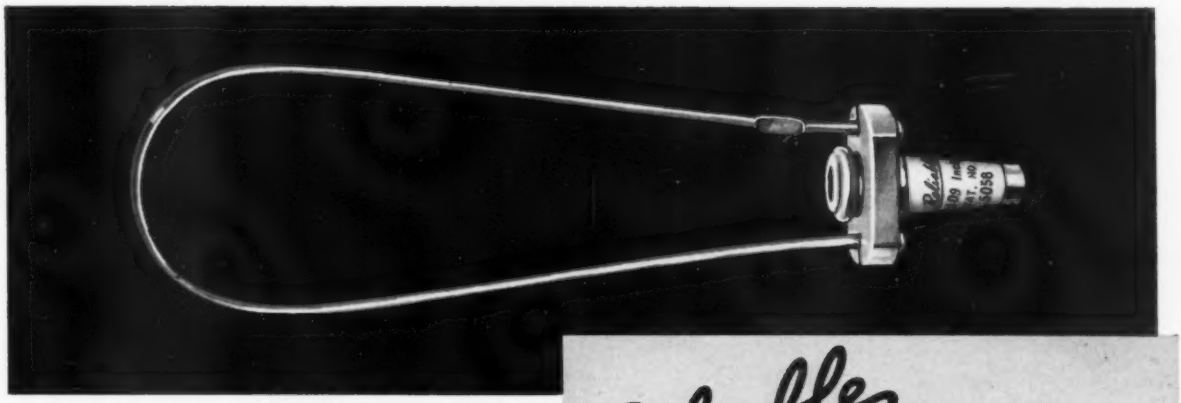

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